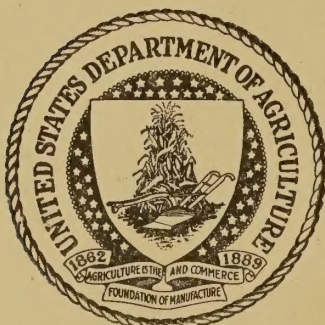






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## TABLE OF CONTENTS

	Page
List of Illustrations .....	iii
List of Statistical Tables .....	iv
Introduction .....	1
Physical factors .....	3
Mapping Technique .....	6
Soils .....	6
Description .....	6
Extent and distribution .....	8
Slopes .....	12
Description .....	12
Extent and distribution .....	14
Erosion .....	15
Description .....	15
Extent and distribution .....	17
Systems by soil and land types .....	19
ratings .....	22
ial factors .....	30
tion .....	31
Size of farm .....	32
Cropping systems .....	33
livestock systems .....	36
rm labor .....	40
ownership and tenure .....	41
Type of ownership .....	41
Type of tenure .....	42
Financial conditions .....	43
Real estate mortgages .....	44
Chattel mortgages .....	45
Tax delinquency .....	46
Rural school finance .....	48
Financial progress .....	53
Social factors .....	54
Age and education .....	54
Classification of farmsteads .....	56
Modern conveniences .....	58
Models of automobiles .....	59

1. The first part of the report is a general introduction to the subject of the study. It discusses the importance of the study and the objectives of the research. It also provides a brief overview of the methodology used in the study.

2. The second part of the report is a detailed description of the study area. It includes information about the location of the study area, the population of the study area, and the characteristics of the study area. It also discusses the data sources used in the study.

3. The third part of the report is a description of the methodology used in the study. It includes information about the research design, the data collection methods, and the data analysis methods. It also discusses the limitations of the study.

4. The fourth part of the report is a description of the results of the study. It includes information about the findings of the study, the conclusions drawn from the findings, and the implications of the findings. It also discusses the strengths and weaknesses of the study.

5. The fifth part of the report is a conclusion and recommendations. It summarizes the findings of the study and provides recommendations for future research. It also discusses the overall impact of the study and the contributions of the study to the field of study.



TABLE OF CONTENTS  
(continued)

	Page
Application .....	60
Desirable adjustments in land use .....	60
Crop vs. non-crop land .....	60
Conservation practices .....	63
Size and type of unit most likely to succeed .....	63
Rural land appraisal and productivity .....	70
Assessment for taxation .....	70
Agricultural Conservation Association appraisals .....	73
Mortgaged valuations .....	74
Relation of size and type of unit, tenure, insti- tutional pattern, and other factors to effective conservation practices and land use .....	75
Appendix .....	77





## List of Illustrations

Following  
page

Figure 1. Approximate location of subareas selected for 1936 Area Planning Projects .....	3
Figure 2. Soil and land use pattern .....	6
Figure 3. Estimated productivity of soils on loessial upland of Furnas County, Nebraska .....	25
Figure 4. Operating unit pattern, Union Township, Furnas County, Nebraska, 1936 .....	31
Figure 5. Ownership pattern, Union Township, Furnas County, Nebraska, 1936 .....	41
Figure 6. Operating unit pattern based on type of tenure .....	43
Figure 7. Operating unit pattern based on type of ownership .....	45
Figure 8. School district pattern, Furnas County, Nebraska, 1936 .....	49
Figure 9. Institutional pattern, Union Township, Furnas County, Nebraska, 1936 .....	56
Figure 10. Assessment unit pattern, Union Township, Furnas County, Nebraska, 1936 .....	71
Figure 11. Estimated acre productivity under present use and assessed valuation of the 150 assessed tracts in Union Township, Furnas County, Nebraska, 1936 .....	71
Figure 12. Estimated acre productivity under desirable use and assessed valuation of the 150 assessed tracts in Union Township, Furnas County, Nebraska, 1936 .....	71
Figure 13. Scatter diagram of relation between the estimated acre productivity and assessed valuation of the 150 assessment tracts in Union Township, Furnas County, Nebraska, 1936 .....	72





## List of Statistical Tables

	Page
Table 1. The acres in each soil type by use groups as mapped in Union Township, Furnas County Nebraska .....	9
Table 2. Percentage distribution of the land into use groups by soil types .....	10
Table 3. Percentage distribution of the land into slope groups by soil types .....	14
Table 4. Percentage distribution of the land into erosion classes by soil types .....	18
Table 5. Average of 1935 and 1936 cropping systems by soil types from 202 records of the Furnas County Agricultural Conservation Association and assigned county base acreages .....	20
Table 6. Estimates pertaining to the utilization of all farm land in Furnas County .....	23
Table 7. Estimated relative productivity of the various crops on the soils of the bottom lands, terraces, and uplands .....	28
Table 8. Estimated acre yields of the various crops on the soils of the bottom lands, terraces, and uplands .....	29
Table 9. Estimated production in feed units of the various crops on the soils of the bottom lands, terraces, and uplands .....	30
Table 10. Distribution of farms by size groups in Union Township, Furnas County, Nebraska, 1936 ..	32
Table 11. Utilization of land in 1935 and 1936 on 72 farms in Union Township .....	33
Table 12. The 1935, 1936, normal, and recommended acreages of four important crops; average of 47 farms in Union Township .....	34
Table 13. The opinions of the operators as to the carrying capacity of native grass pastures on 62 farms by size groups in Union Township ....	35
Table 14. Animal units of productive livestock and numbers of breeding stock per 100 acres in farms and in crops for Furnas County and Union Township .....	37



List of Statistical Tables  
(continued)

	Page
Table 15. Total livestock and average numbers of livestock and animal units on 66 farms in Union Township .....	38
Table 16. Kind and number of animal units (1935-36 and normal) and the farm and crop acres on 50 farms in Union Township .....	40
Table 17. The relation between size of farm and labor requirement on 66 farms in Union Township .....	41
Table 18. Extent and proportion of land held by types of owners .....	42
Table 19. Type of tenure on 77 farms entirely or partly within Union Township .....	43
Table 20. Extent of real estate mortgages on record and proportion held by different types of mortgagees .....	44
Table 21. The relation between size of farm and the chattel mortgages of the 61 farmers living in Union Township .....	45
Table 22. Delinquent real estate tax summary for the years 1926 to 1935 in Union Township .....	47
Table 23. Tax delinquency frequency from 1926 to 1934 for the 150 assessed tracts of land in Union Township .....	49
Table 24. The real estate valuations and school levies for the years 1926 to 1935 expressed in percentages of the respective 10-year averages for the eight school districts entirely or partly within Union Township .....	50
Table 25. Average 1930 and 1935 valuations and their distribution into personal, real estate, and public utilities, and school, county, and state levies, for the 93 rural school districts in Furnas County, Nebraska .....	51
Table 26. Relation between size of farm and change in net worth of 27 farmers in Union Township .....	53
Table 27. Relation between the size of farm and the ages of farm operators, farm women, and their children living at home on 64 farms in Union Township .....	55





List of Statistical Tables  
(continued)

Page

Table 28.	Relation between the size of farm and the education of farm operators and women and their children over 18 years of age on 64 farms in Union Township .....	56
Table 29.	Relation between the size of farm and the classes of farmsteads occupied by farm operators on 61 farms in Union Township .....	57
Table 30.	Relation between the size of farm and the modern conveniences in farm residences on 62 farms in Union Township .....	58
Table 31.	Relation between the size of farm and the models of automobiles owned by farmers on 64 farms in Union Township .....	59
Table 32.	Summary of desirable adjustments in land use .....	63
Table 33.	Relation between recommended and present size of operating unit of 60 farmers in Union Township .....	64
Table 34.	Estimated average income and expenses on different sized farms in Union Township ... ..	66

APPENDIX

Table 35.	Use, soil, slope, and erosion classification of all land in Union Township, Furnas County, Nebraska .....	78
Table 36.	Use and physical classification and estimated productivity of the soils in Furnas County .....	79, 80
Table 37.	Relation between size of farm and the utilization of land on 72 farms in Union Township ....	81
Table 38.	Relation between the number of crop acres and the utilization of land on 72 farms in Union Township .....	82
Table 39.	The relation between size of farm and 1935, 1936, normal, and recommended acreages of important crops on 47 farms in Union Township ...	83
Table 40.	The relation between size of farm and the kind and number of livestock in 1935, 1936, and two-year average on 66 farms in Union Township ..	84





List of Statistical Tables  
(concluded)

	Page
Table 41. The relation between size of farm, the kind and number of animal units, and the farm and crop acres per animal unit in 1935, 1936, two-year average, and normal on 50 farms in Union Township .....	85
Table 42. The total valuations, and their percentage distribution into personal, real estate, and public utilities, and the school levy with its ratio to the total levy for the 93 rural school districts in Furnas County .....	86-93
Table 43. Relation between size of farm and the financial progress of 27 farmers since locating on the farms they are now operating in Union Township .....	94



# LAND USE PLANNING IN SOUTHWEST NEBRASKA<sup>1/</sup>

Arthur Anderson and Reuben W. Hecht<sup>2/</sup>

## INTRODUCTION

It is becoming increasingly evident that programs designed to bring about more effective land use should be preceded and guided by more careful and detailed physical, economic, and social studies than have been attempted heretofore. The rapidly accumulating mass of information, much of which is of a very general nature, points to more serious maladjustments in land use than have been generally appreciated. Compared to their recognition, the correction of such maladjustments becomes exceedingly difficult and complex. If effective programs of land-use planning and adjustments are to be developed, they must be inclusive and properly supported and directed.

---

<sup>1/</sup> Conducted as a cooperative project between the Nebraska Agricultural Experiment Station and the Land Use Planning Section, Resettlement Administration. Comparable surveys were made in Buffalo, Clay, and Cheyenne-Kimball counties by the Experiment Station in cooperation with the Bureau of Agricultural Economics, Agricultural Adjustment Administration and Soil Conservation Service. Within the Experiment Station, these projects are designated as Sub-projects 2 and 3 of Station Project 231 - Land Utilization Research, and were under the general direction of the Land Utilization Research and Policy Advisory Committee. Sub-projects 2 and 3 were in direct charge of the Nebraska Land Use Planning Specialist and Dr. L. F. Garey, Department of Rural Economics, Nebraska Agricultural Experiment Station, respectively.

<sup>2/</sup> Nebraska Land Use Planning Specialist and Assistant Specialist, respectively. The assistance of many staff members of the Agricultural Experiment Station, Agricultural Extension Service, and the Conservation and Survey Division of the University of Nebraska, and of the Bureau of Agricultural Economics, Soil Conservation Service, and Land Use Planning Section, Resettlement Administration, of the United States Department of Agriculture, is gratefully acknowledged.



at the time of the first meeting of the committee

on the 10th of January 1881

the committee was composed of the following members

The primary objectives of the study reported herein were to develop, if possible, a more satisfactory and effective land use planning procedure, and to define the problems within the area studied. Obviously any procedure will be modified and improved by experience and must be adjusted to meet local conditions. As indicated, it is believed that efforts should be turned from the rather generalized type of approach commonly used to more detailed and specific research. As such programs are developed they probably must become temporarily more or less restricted with respect to the areas studied. If such areas are carefully selected, however, it would appear that the conclusions and interpretations derived therefrom may be applied in a general way to the larger areas which they represent. Specific programs of action, however, should be based on carefully and locally determined plans.

The methods employed, the factual information assembled, together with preliminary interpretations for the area studied are presented herewith. In order to simplify organization and presentation, a discussion of methods, the factual information, and the less involved interpretations are treated together wherever possible. The physical data are presented first, followed by the economic and social. Finally, in the Application, an effort is made to bring together and interpret the various interrelated physical, economic, and social factors. It is to be noted that the large tables carrying detailed





information have been assembled in the appendix<sup>1/</sup>, whereas the smaller generalized tables and illustrations are presented in connection with the discussion. It is hoped that this study may be helpful in developing land utilization research, not only in Nebraska, but elsewhere.

#### LOCATION OF AREA

In connection with the selection of the general area, consideration was given to the three other areas proposed for study under the parallel project. It was rather generally agreed that the four subareas should be located in Type-of-Farming Areas 188-B, 193, 195, and 196. These areas, together with the approximate location and size of the subareas finally selected for study, are shown in Figure 1. The sponsorship of the study in Area 196 was assumed by the Land Use Planning Section, Resettlement Administration.

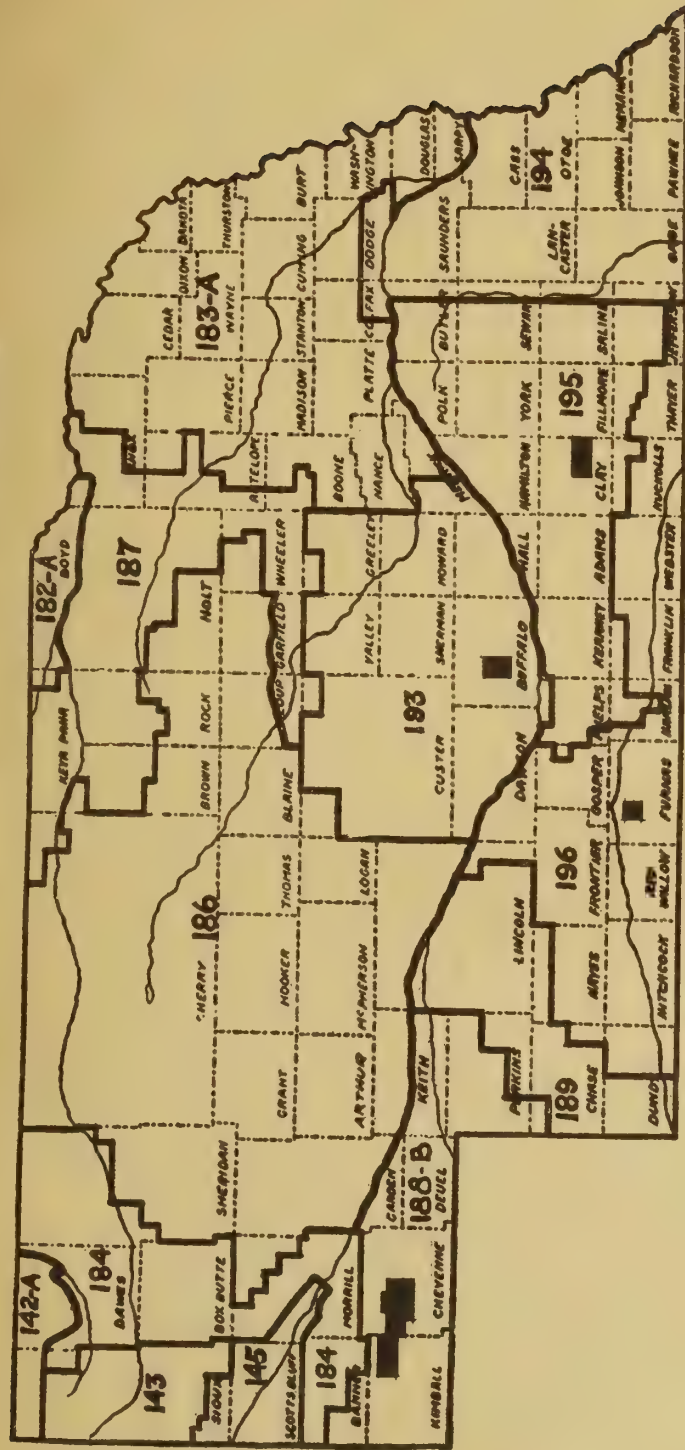
Area 196 is the Republican Valley region of south central Nebraska. It is a strongly dissected plain ranging from rather gently sloping table lands in the east to abrupt canyon lands in the west. The general geologic, climatic, and soil characteristics and cropping practices and economic conditions have been described

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<sup>1/</sup> Tables 35 to 43, pages 78 to 94.



# Type Of Farming Areas Of Nebraska

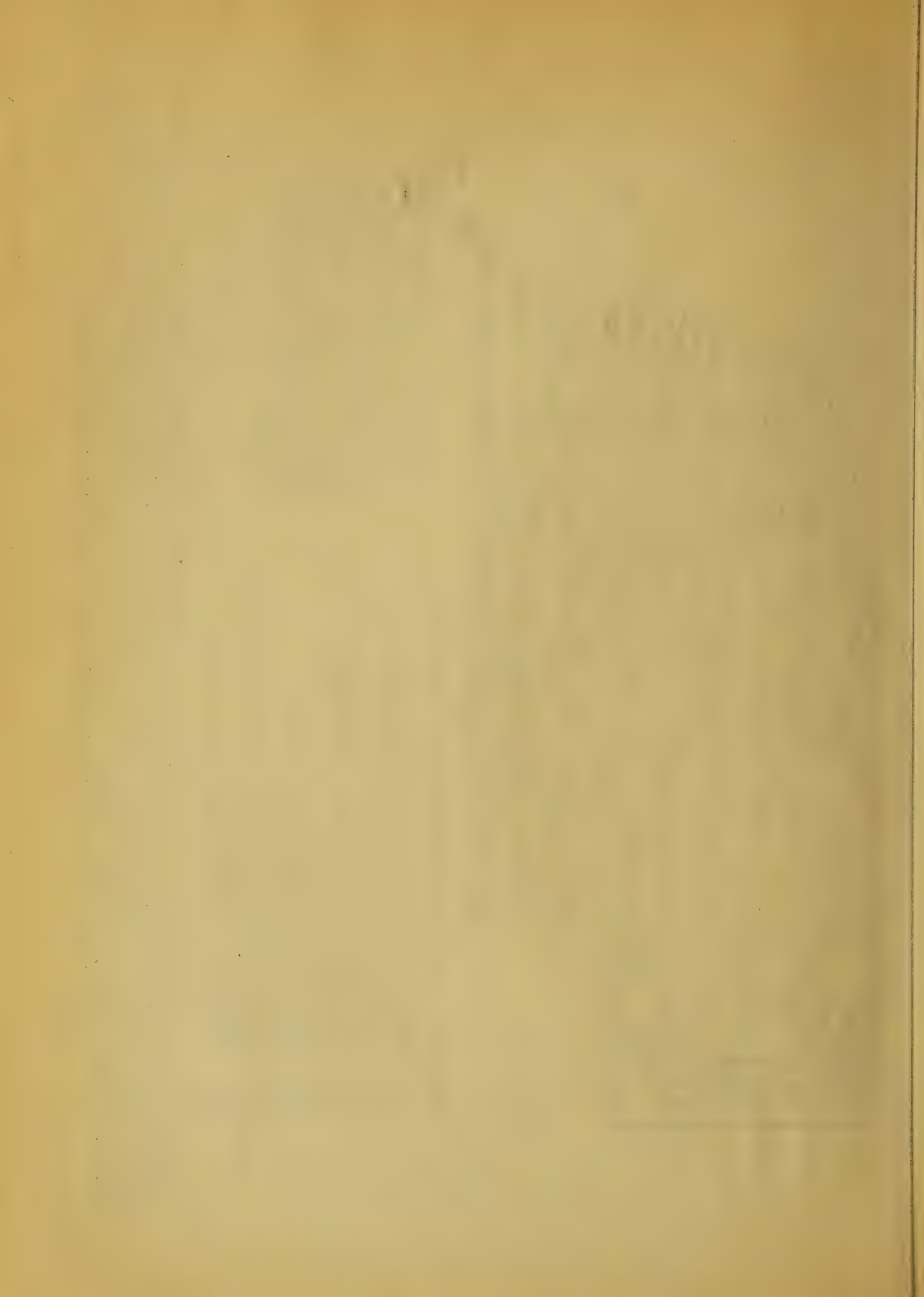


## DOMINANT TYPES OF PRODUCTION BY AREAS

- 142-A RANGE LIVESTOCK, GRAIN, HAY
- 143 RANGE LIVESTOCK, CASH GRAIN, POTATOES
- 145 SUGAR BEETS, LIVESTOCK, POTATOES
- 182-A LIVESTOCK, CASH GRAIN
- 183 INTENSIVE LIVESTOCK PRODUCTION
- 184 CASH GRAIN, LIVESTOCK, POTATOES
- 186 RANGE LIVESTOCK
- 187 LIVESTOCK, WILD HAY, CASH GRAIN
- 188-B CASH GRAIN, LIVESTOCK
- 189 CASH GRAIN, LIVESTOCK
- 193 LIVESTOCK, GENERAL FARMING, SOME CASH GRAIN
- 194 GENERAL FARMING
- 195 CASH GRAIN, LIVESTOCK
- 196 LIVESTOCK, CASH GRAIN, GENERAL FARMING

SOURCE OF INFORMATION:  
DEVELOPED COOPERATIVELY BY  
THE NEBRASKA AGRICULTURAL  
EXPERIMENT STATION AND  
VARIOUS FEDERAL AGENCIES  
ENGAGED IN LAND UTILIZATION  
RESEARCH AS A PART OF THE  
1935 REGIONAL PLANNING  
PROJECT.

FIGURE 1. APPROXIMATE LOCATION AND SIZE OF THE FOUR SUB-AREAS SELECTED FOR THE 1936 AREA PLANNING PROJECTS OF THE NEBRASKA AGRICULTURAL EXPERIMENT STATION AND BUREAU OF AGRICULTURAL ECONOMICS, SOIL CONSERVATION SERVICE, AGRICULTURAL ADJUSTMENT ADMINISTRATION, AND RESETTLEMENT ADMINISTRATION, UNITED STATES DEPARTMENT OF AGRICULTURE





in a recent mimeographed report - "Republican Valley Land Use Report" - of the Nebraska College of Agriculture<sup>1/</sup>, and will not be reviewed in this connection.

Owing to type of topography, soils, rainfall, and land use, water erosion has become a serious problem in this area, not only from the standpoint of depleting soil resources, but in increasing flood hazards along the streams. Because of cultural practices and relatively unfavorable growing conditions during recent years, wind erosion is also becoming an increasing menace. Although the average rainfall, which ranges from about 28 inches in the east to 18 inches in the west, is ample to produce relatively good crops, its type and distribution together with commonly unfavorable temperature and wind conditions result in this being an area of high climatic risk. It was felt, therefore, that a detailed physical, economic, and social survey for a carefully selected subarea or sample would not only serve the purpose of developing land-use planning methods, but would also have rather specific application within the area studied and

---

<sup>1/</sup> This report, which is limited to the Nebraska Section of the Republican Valley watershed, has been prepared by the following committee at the request of Dean W. W. Burr of the College of Agriculture, University of Nebraska.

L. F. Garey, Agricultural Experiment Station, University of Nebraska

P. H. Stewart, Agricultural Extension Service, University of Nebraska

F. A. Hayes, Conservation and Survey Division, University of Nebraska

I. D. Wood, Shelterbelt Project, U. S. Department of Agriculture

E. B. Engle, Soil Conservation Service, U. S. Department of Agriculture

Arthur Anderson, Land Utilization Division, Resettlement Administration



general application throughout the larger area.

Although the conditions throughout Area 196 are more or less comparable, it was recognized that the results obtained from one relatively small sample would have decreasing significance with distance from the area studied. It was desired, however, to select a subarea that would represent average conditions as nearly as possible. After a rather careful study and consideration of soil survey maps, climatic conditions, land use, farm size and organization, and other data, Furnas County was selected as being the most representative county within the area. The townships within the county were then considered in a similar manner and three selected for field observation. Following the field observations and consultation with the County Agricultural Agent, Union Township (T. 3N, R. 23W) was finally chosen for the detailed surveys.

The physical mapping was limited to the one township of 36 square miles. Efforts were made to secure economic and other information for all operating units lying entirely or partly within this area. The acreage covered by such records is thus somewhat larger than that covered by the physical map. In addition, information regarding mortgage indebtedness and public finance (including tax delinquency) was obtained from the county records on either a township or county basis.





## PHYSICAL FACTORS

### Mapping Technique

The physical surveys include all the features mapped in place such as soil types, slopes, degree of erosion, land use, roads, fences, farmsteads, and schools. The general procedure followed and symbols used in the field mapping were those approved and in use by the Bureau of Chemistry and Soils and the Soil Conservation Service, United States Department of Agriculture. The features to be shown, scale of mapping, slope groups, and other conditions were determined following a reconnaissance survey of the area. Since soil type, slope, and erosion lines commonly overlie, it was concluded that mapping four inches to the mile would give sufficient detail and accuracy. The next step was the development of a base map for the area and this was followed in turn by the detailed mapping. Two men with one plane table did the field mapping, and on the average they were able to map almost a section a day.

The features mapped and the symbols used are shown in connection with the Soil and Land Use Pattern of Union Township (Figure 2).

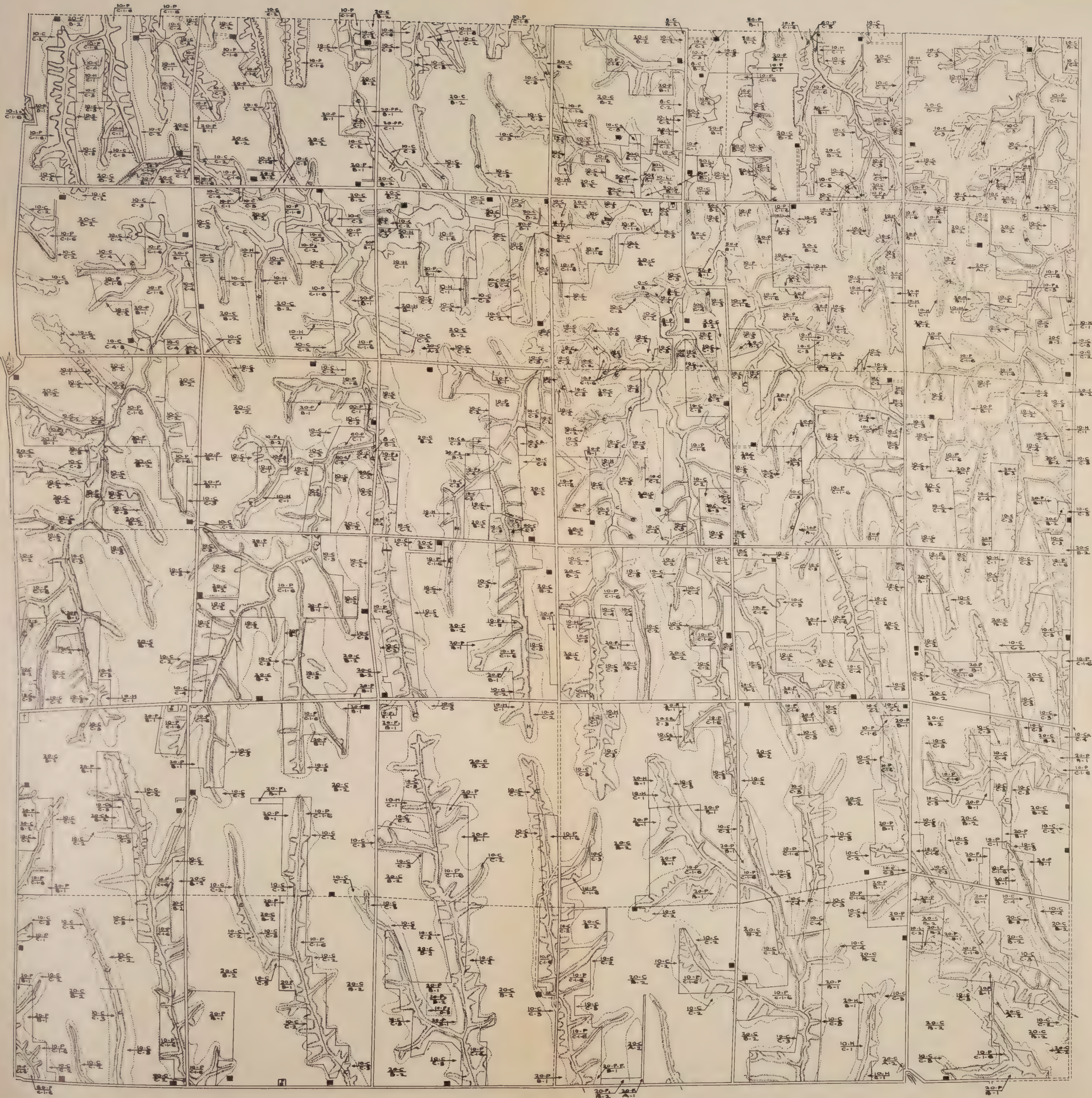
### Soils

#### Description

The Hall silt loam is a mature, very productive, well drained soil developed on the terraces. Although it is an important soil in the county, it is of little agricultural importance in Union Township because of its limited extent and location.







## LEGEND

### SOIL TYPES

- 8 JUDSON SILT LOAM
- 10 COLBY SILT LOAM
- 20 HOLDREDGE SILT LOAM
- 50 HALL SILT LOAM
- 60 NUCKOLLS SILT LOAM

### SLOPE GROUPS

- A 0 TO 1 PER CENT
- B 1 TO 5 PER CENT
- C 5 TO 15 PER CENT
- D 15 PER CENT AND OVER

### CLASSES OF EROSION

- 1 NO APPARENT EROSION
- 2 LESS THAN 25 PER CENT OF SOIL REMOVED
- 3 MODERATE TO SERIOUS SHEET EROSION FROM 25 TO 75 PER CENT OF SOIL REMOVED
- 4 SEVERE SHEET EROSION OVER 75 PER CENT OF SOIL REMOVED
- 5 VERY SEVERE SHEET EROSION SOIL ENTIRELY REMOVED WITH SOME EROSION OF PARENT MATERIAL
- 6 CATSTEPS
- 8 GULLIES LESS THAN 100' APART

### PRESENT LAND USE

- C CULTIVATED
- L ALFALFA
- C<sub>a</sub> IDLE CROP LAND LARGELY WEEDS
- P PASTURE
- P<sub>x</sub> ABANDONED CROP LAND LARGELY REVEGETATED
- H NATIVE MEADOW
- F SCATTERED FOREST
- L<sub>o</sub> WASTE LAND

### CONVENTIONAL SYMBOLS

- INTERMITTENT STREAMS
- DRAINAGE WITH NO PERCEPTIBLE CHANNEL OR A GULLY LESS THAN 3 FT. DEEP - CROSSABLE BY MACHINERY
- A GULLY LESS THAN 3 FT. DEEP - NOT CROSSABLE BY MACHINERY
- A GULLY MORE THAN 3 FT. DEEP - NOT CROSSABLE BY MACHINERY
- CONTROLLED OR STABILIZED PORTION OF GULLY
- FARMSTEAD
- SCHOOL
- CEMETERY
- PRIMARY ROAD
- SECONDARY ROAD
- USE BOUNDARY
- SOIL, SLOPE, AND EROSION BOUNDARY
- D SLOPE - ESCARPMENT
- DAM
- ROCK OUTCROPS

### SEQUENCE OF SYMBOLS

SOIL TYPE - LAND USE  
SLOPE - EROSION - DESCRIPTION

EXAMPLE:

10-P COLBY SILT LOAM - PASTURE  
C-1-6 5 TO 15% SLOPE - NO EROSION - CATSTEPS

SCALE OF MILES



**FIGURE 2. SOIL AND LAND USE PATTERN**  
UNION TOWNSHIP (T.3N., R.23 W.) FURNAS COUNTY, NEBRASKA 1936

PREPARED BY  
NEBRASKA AGRICULTURAL EXPERIMENT STATION  
IN COOPERATION WITH  
LAND USE PLANNING SECTION  
LAND UTILIZATION DIVISION  
RESETTLEMENT ADMINISTRATION - REGION VII  
U. S. DEPARTMENT OF AGRICULTURE







The Judson silt loam is an immature soil formed from relatively recent colluvial-alluvial deposits. It is a productive soil, but of minor extent in both the county and in Union Township.

The Holdroge silt loam is the second most extensive soil in the county and in Union Township. It is a mature, productive soil formed from light gray loessial material, and is well-suited to arable farming. The soil occurs on long, almost level to gently sloping divides between the canyon-like drainage ways. The surface soil ranges from 8 to 16 inches in thickness.

Colby silt loam is the most extensive soil in the county and in Union Township. It is an immature soil formed from the same type of material as the Holdroge silt loam, but because of its position on steep slopes and sharp divides the surface soil seldom exceeds 6 or 7 inches in thickness. Geologic land slippage on the steeper grassed slopes has caused a succession of almost vertical exposures known as catsteps. Inherently Colby silt loam is relatively low in productivity and poorly suited to arable farming.

Nuckolls silt loam, eroded phase, is of minor extent, both in the county and in Union Township. With respect to position and productivity, it is quite similar to Colby silt loam. It is formed on Loveland loess, a reddish-brown material underlying the Peorian or light gray material on which the Holdroge and Colby silt loams are developed.



Since soils in this area are generally well supplied with the essential mineral elements, productivity is rather directly dependent on the maintenance of a desirable level of organic matter and nitrogen. Mature soils or those on the more level land have normally developed surface soils of 8 inches or more in thickness. The productivity of such soils may be maintained at their present and generally satisfactory levels more or less indefinitely under reasonable systems of management. The immature soils developed on rolling to steep land, however, have a much thinner topsoil and inherently are much less productive. Any material loss in their surface soil will result in a lower and undesirable level of productivity.

#### Extent and distribution

The acres in each soil type by use groups are shown in Table 1 for Union Township, and the percentages based on the respective soil types and all land in the area are reported in Table 2.

The two soils developed from alluvium, Hall and Judson silt loams, comprise 1.6 and 2.9 per cent of the total area, with 34.1 and 61.7 per cent of the respective soils under cultivation. The Hall silt loam is found on Crum Creek Terrace in the northeastern part of the township. The Judson silt loam is mapped on the wider canyon floors. These two soils are the most productive soils in the area, but are not particularly well suited to arable farming because





Table 1. The acres in each soil type  
by use groups, as mapped in  
Union Township, Furnas County, Nebraska, 1936.

Soil type	Acres in				
	Crop land	Native grass land	Other farm land	Total	
(1)	(2)	(3)	(4)	(5)	
Hall silt loam	124.8	217.6	23.5	365.9	
Judson silt loam	403.9	215.0	35.5	654.4	
Holdrege silt loam	9599.9	526.5	134.0	10260.4	
Colby silt loam	4195.0	6317.9	472.8	10985.7	
Nuckolls silt loam	3.7	15.3		19.0	
Total	14327.3	7292.3	665.8	22285.4	



Table 2. Percentage distribution of the land  
into use groups by soil types,  
Union Township, Furnas County, Nebraska, 1936.

Soil type	Per cent in				
	Crop land	Native grass land	Other farm land	Total	
(1)	(2)	(3)	(4)	(5)	
Percentages based on all land in each soil type					
Hall silt loam	34.11	59.47	6.42	100	
Judson silt loam	61.72	32.86	5.42	100	
Holdrege silt loam	93.56	5.13	1.31	100	
Colby silt loam	38.19	57.51	4.30	100	
Nuckolls silt loam	19.47	80.53	-	100	
Total	64.29	32.72	2.99	100	
Percentages based on all land in area					
Hall silt loam	0.56	0.98	0.10	1.64	
Judson silt loam	1.81	0.96	0.17	2.94	
Holdrege silt loam	43.08	2.36	0.60	46.04	
Colby silt loam	18.83	28.35	2.12	49.30	
Nuckolls silt loam	.01	.07	-	.08	
Total	64.29	32.72	2.99	100.00	





of their narrow and irregular outline and position. Where the tracts are sufficiently large and run-off from the higher lying land is reduced to a minimum, the most effective use of such land would be as crop land, especially for gardens and small fields of alfalfa. The area under crop, however, probably should not be increased materially over that being cropped at the present time.

The Holdrege silt loam is the most productive soil of the uplands, and 93.6 per cent of it is under cultivation. It comprises 46.0 per cent of the total area and is generally well suited to cultivation. With few exceptions, the small portion remaining in native grass land is in small irregular or isolated tracts. In the northeastern part of the county where larger areas of this soil are found and entire farms are located upon it, a somewhat larger percentage has been retained in grass to supply pasture.

The Colby silt loam is the most extensive soil in the area, comprising 49.3 per cent of the total. Crop land occupies 38.2 per cent of the type, which is 18.8 per cent of all land in the area. The most serious and extensive land-use problems are associated with this soil and its management. The fact that the area ratio between the two major soils of the uplands, Holdrege and Colby silt loams, was essentially the same for the original soil survey and the present survey increases the confidence that may be placed in the mapping.



Nuckolls silt loam, eroded phase, occupies but .08 per cent of all land and .01 per cent of the crop land in the area.

With respect to the area as a whole, 64.3 per cent is in crop land, 32.7 per cent in native grass land, and 3.0 per cent in other farm land. These ratios do not differ materially from estimates for the entire county.

### Slopes

#### Description

Factors determining the range in slope groups were type and depth of soil, kind of parent material, degree of erosion, and other conditions peculiar to the area. The slope groups were so defined as to represent certain use possibilities or limitations.

Slope A (0 - 1 per cent) includes the almost level or flat areas where run-off and water erosion are at a minimum. Although the areas in this slope range are very inextensive, they comprise the most productive soils developed on the uplands. No special cropping or cultural limitations are considered necessary for these soils, but since they are generally operated in connection with the soils in the B slope group they should receive the same treatment.

Slope B (1 - 5 per cent) includes land on the gently rolling slopes upon which erosion may become active, but upon which





effective control measures may be readily established without any crop restrictions. Such practices would include contouring and strip cropping. These practices may be stressed from the standpoint of moisture conservation and wind erosion more than that of water erosion.

Slope C (5 - 15 per cent) includes the land upon which severe sheet erosion commonly occurs under the prevailing cropping practices. These slopes are too steep to effectively use erosion control measures with clean tilled or fallow crops or even to control erosion with contouring and stripping close-drilled crops. It would appear that the greater part of such crop land should be returned to permanent grass since the number of crops that may be close-drilled are limited and average yields may not justify more expensive control measures.

Slope D (15 per cent and over) is limited largely to the canyon walls which in many instances are almost vertical. D Slopes are generally in native grass, although a few instances were observed where cropped fields extended from the C Slope over the D Slope and onto the canyon floors. All D Slope crop land should be returned to permanent grass. The D Slopes were not differentiated, due to their narrowness, but are shown on the map (Figure 2) by hachures.



Extent and distribution

In terms of the entire area, 0.2, 50.4, and 49.4 per cent of the land was mapped in Slope Groups A, B, and C, respectively (Table 3.)

Table 3. Percentage distribution of the land into slope groups by soil types, Union Township, Furnas County, Nebraska, 1936.

Soil type	Per cent in				Total
	Slope A	Slope B	Slope C		
(1)	(2)	(3)	(4)		(5)

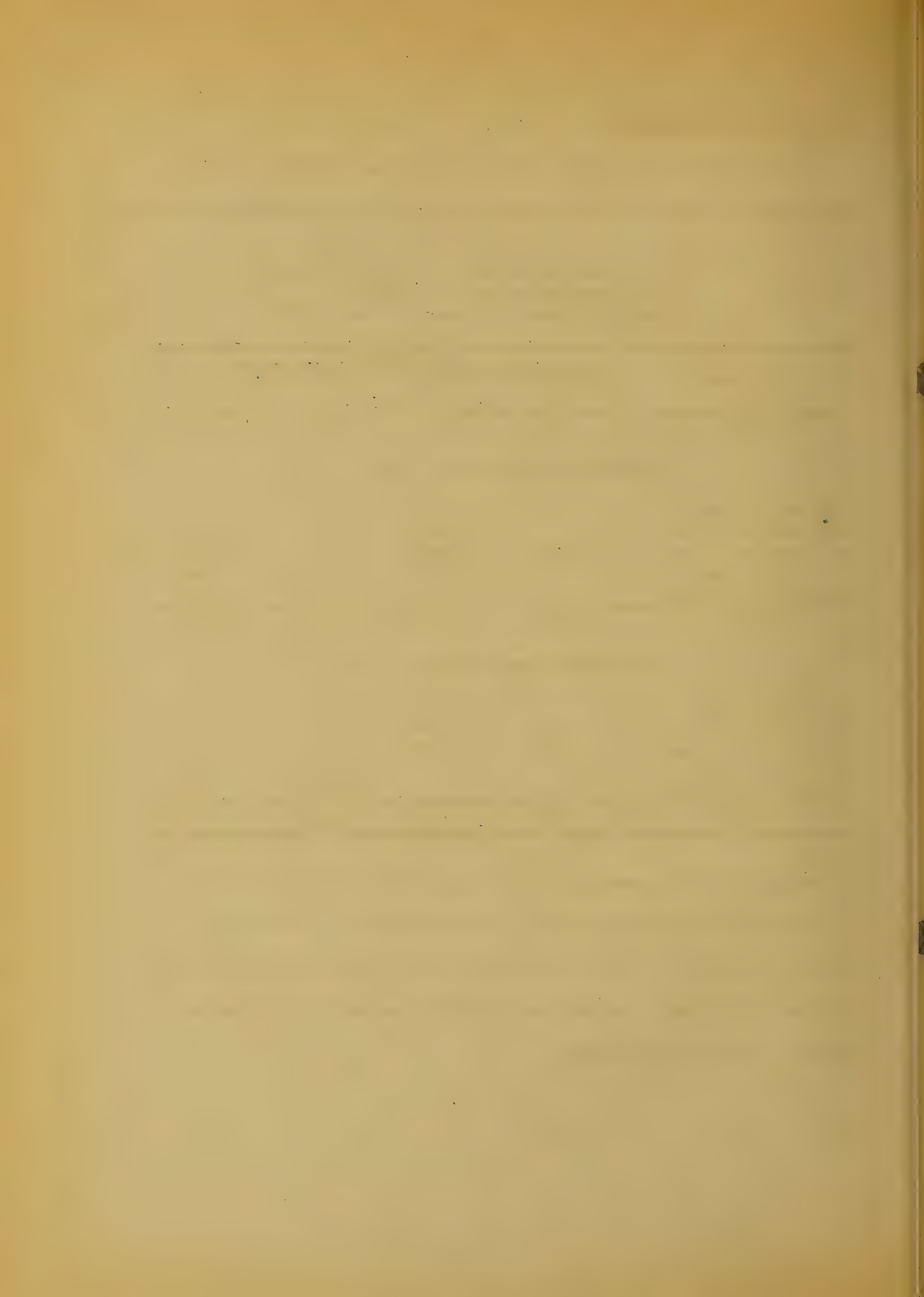
## Percentages based on all land

Hall silt loam	:	:	1.64	:	1.64
Judson silt loam	:	:	2.94	:	2.94
Holdrege silt loam	:	0.17	45.87	:	46.04
Colby silt loam	:	:	:	49.30	49.30
Muckolls silt loam	:	:	:	.08	0.08
Total	:	0.17	50.45	:	49.38 : 100.00

## Percentages based on crop land

Hall silt loam	:	:	0.87	:	0.87
Judson silt loam	:	:	2.82	:	2.82
Holdrege silt loam	:	0.23	66.78	:	67.01
Colby silt loam	:	:	:	29.29	29.29
Muckolls silt loam	:	:	:	0.01	0.01
Total	:	0.23	70.47	:	29.30 : 100.00

In contrast to the preceding percentages for all land, 0.2, 70.5, and 29.3 per cent, respectively, of the crop land is in Slope Groups A, B, and C. With the exception of a small percentage of Holdrege silt loam, the various soil types as mapped are entirely within a single slope group.





Since the range for Slope A is very narrow, 0 - 1 per cent, only 0.2 per cent of the entire area - the almost level Holdrege silt loam - falls into this group. Because of the gradient, the soils on the terraces and canyon floors are in Group B. It should be recalled that no crop restrictions are considered necessary for soils on A and B Slopes, and that cultural practices should be considered primarily from the standpoint of moisture conservation and control of wind erosion.

Approximately one-half of the entire area is in the C Slope range. It is estimated that the D Slope, which was not differentiated and measured because of its position, does not comprise more than one per cent of this. With 29.3 per cent of all the crop land in the C Slope, and the restrictions which appear necessary if this land is to be maintained in cultivation, it is very evident that a serious land-use problem exists.

### Erosion

#### Description

Sheet erosion may be defined as the gradual removal of the soil more or less evenly over a considerable area. Gully erosion is the cutting of ditches by the concentration of run-off water. Classes are used to designate the type and amount of accelerated or induced erosion which has taken place upon the soil profile.



The degree of erosion is determined by contrasting the eroded profile with a normal or uneroded profile as observed under virgin grass cover. Any stated degree of erosion, therefore, is much more serious with a soil having an initial thin topsoil than with one having a deep topsoil.

Class 1 - No apparent sheet erosion. This class includes areas of virgin grass land upon which there is no apparent erosion.

Class 2 - Slight sheet erosion. This class includes all cropped soils with less than 25 per cent of the topsoil removed. It thus may include soils with no measurable erosion or even those on which deposition is occurring.

Class 3 - Moderate to serious sheet erosion. This class includes areas with 25 to 75 per cent of the topsoil removed. Such cultivated areas are marked by accelerated erosion.

Class 4 - Severe sheet erosion. This includes areas with over 75 per cent of the topsoil removed and in the more shallow soils a part of the subsoil removed by accelerated erosion.

Class 5 - Very severe sheet erosion. This class includes areas in which the topsoil or A horizon has been entirely removed and with erosion extending through the subsoil or B horizon into the parent material or C horizon.

Class 6 - Catsteps. Includes the areas in which geological land slippage has occurred. A soil, 4 to 12 inches in depth, has





developed on the narrow benches. The catsteps tend to disappear under cropping conditions.

Class 8 - Frequent gullies. This class includes areas which contain more than three gullies per acre and less than 100 feet apart, but the gullies do not include more than 75 per cent of the area.

#### Extent and distribution

The distribution of all land and crop land into the various erosion classes is summarized in Table 4. It should be recalled that all native grass land was placed in Class 1 or Class 1 - 6 (catsteps), and all crop land in Classes 2 to 5, depending on the degree of sheet erosion.

On the basis of all land, 7.01, 26.67, 53.96, 10.89, 1.45, and 0.02 per cent, respectively, fell in Erosion Classes 1, 1 - 6, 2, 3, 4, and 5. In contrast, crop land was distributed as follows: Class 2 - 82.72 per cent, Class 3 - 15.32 per cent, Class 4 - 1.94 per cent, and Class 5 - 0.02 per cent.

With respect to the three most productive soils, it is to be observed that practically all the crop land is in Class 2 (0 to 25 per cent of the topsoil lost). These soils are inherently very productive and have a surface soil of considerable thickness. A slight loss or even a material loss of surface soil, therefore, would not be very serious.

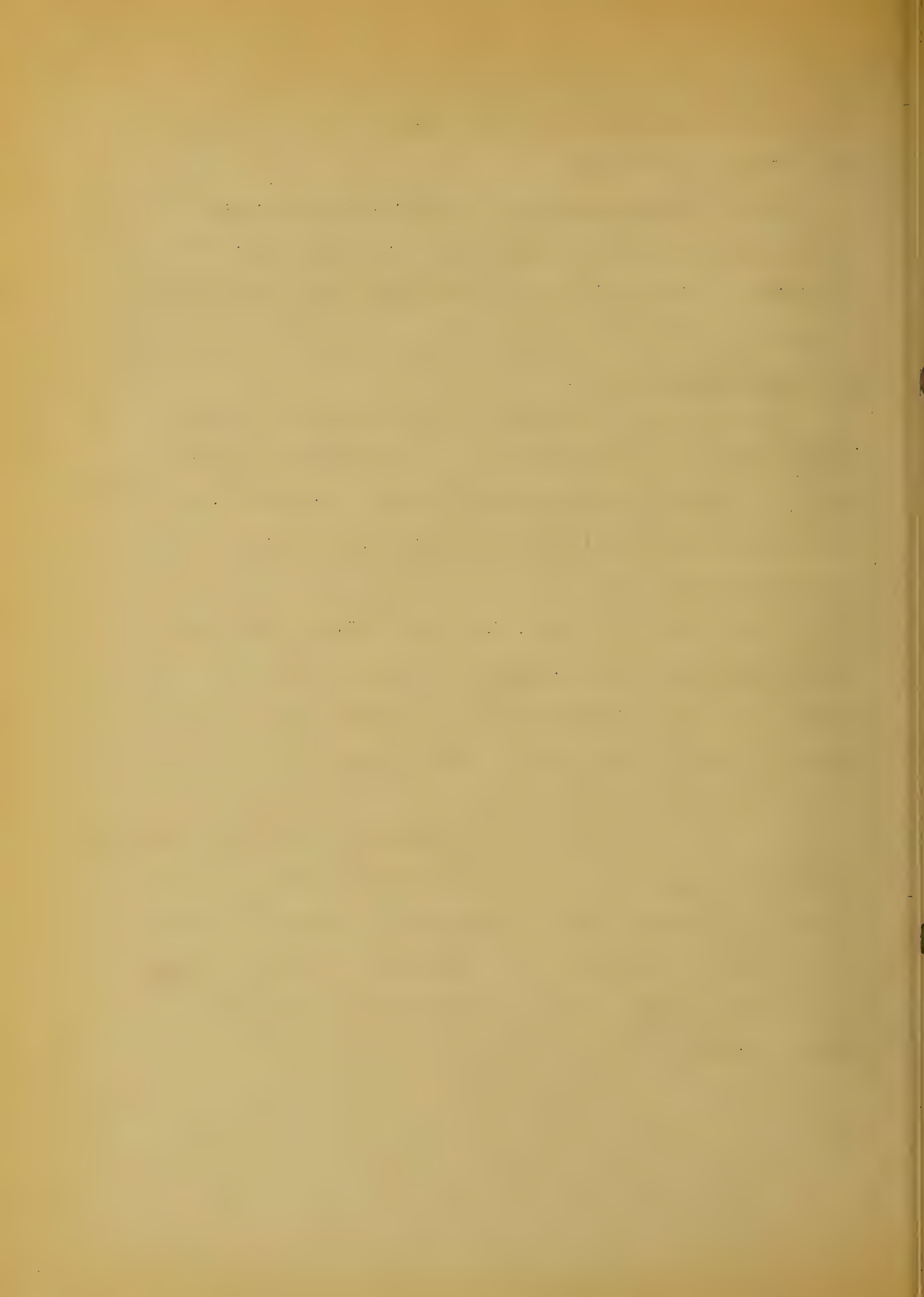


Table 4. Percentage distribution of the land  
into erosion classes by soil types  
Union Township, Furnas County, Nebraska, 1936

Soil type	Per cent in						Total
	:Class:	:Class:	:Class:	:Class:	:Class:	:Class:	
	: 1	: 1 - 6	: 2	: 3	: 4	: 5	
(1)	: (2)	: (3)	: (4)	: (5)	: (6)	: (7)	: (8)
Percentages based on all land							
Hall silt loam	: 1.07:		: 0.57:				: 1.64
Judson silt loam	: 1.09:		: 1.85:				: 2.94
Holdrege silt loam	: 2.87:		: 43.09:	: 0.08:			: 46.04
Colby silt loam	: 1.98:	26.60:	: 8.44:	10.81:	: 1.45:	: 0.02:	: 49.30
Nuckolls silt loam	:	: 0.07:	: 0.01:				: 0.08
Total	: 7.01:	26.67:	: 53.96:	10.89:	: 1.45:	: 0.02:	: 100.00

Percentages based on crop land							
Hall silt loam	:		: 0.87:				: 0.87
Judson silt loam	:		: 2.82:				: 2.82
Holdrege silt loam	:		: 66.89:	: 0.12:			: 67.01
Colby silt loam	:		: 12.13:	15.20:	: 1.94:	: 0.02:	: 29.29
Nuckolls silt loam	:		: 0.01:				: 0.01
Total	:		: 82.72:	15.32:	: 1.94:	: 0.02:	: 100.00

In contrast, the Colby-Nuckolls soils, which are inherently much less productive, have lost relatively much more of their inherent productivity under cultivation. Fifty-nine per cent of these soils have lost 25 per cent or more of their surface soil, and this loss is continuing at a rapid rate under existing cultural practices. Since any measurable loss of topsoil under such conditions is an important consideration, the seriousness of the land-use problem is very evident.





### Cropping Systems by Soil and Land Types

In addition to the land mapped by use groups in Union Township, the cropping systems for all farms in the area were determined for 1935 and 1936, and for the entire county through a sampling of the 1936 records of the Furnas County Agricultural Conservation Association. It is thus possible to estimate the per cent of farm land under cultivation by soil types, as well as the prevailing cropping systems. Using Union Township as a sample, the acreages in the various slope and erosion conditions may be determined for the entire county. It is possible, therefore, not only to estimate the acreages of the important crops by soil types, but also to allot these acreages to the various land types or those conditions which represent reasonably comparable productivity and use capabilities.

Estimates pertaining to the 1935 - 1936 cropping systems and base acreages by soil types are summarized in Table 5.

Certain soil types, because of their similarity or close intermingling, were combined in determining land use from the County Agricultural Conservation Association records. This method of sampling may be used safely since soil types are not generally recognized in laying out fields on individual farms. With the exceptions indicated in Table 5, the farms selected were located entirely on the type or types in question.



Table 5. Average of 1935 and 1936 cropping systems by soil types from 202 records of the Furnas County Agricultural Conservation Association and assigned county base acreages.

Number of Records	Acres and per cent <sup>1/</sup>									
	Total	Culti- vated	Corn	Wheat	Oats	Bar- ley	Sor- ghum	Al- falfa	Other crops	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
SOILS OF THE BOTTOM LANDS										
Lamoure, Sarpy, and Cass series										
24	4500:	1844:	1140:	60:	88:	54:	115:	126:	261	
	100:	41:	62:	3:	5:	3:	6:	7:	14	
	37760:	15482:	9599:	465:	773:	464:	929:	1084:	2168	
SOILS OF THE TERRACES										
Hall, Bridgeport, Judson, and Butler series										
53	8592:	7217:	3681:	1371:	216:	289:	289:	38:	433	
	100:	84:	51:	19:	3:	4:	4:	13:	6	
	65920:	55373:	28240:	10521:	1661:	2215:	2215:	7199:	3322	
SOILS OF THE UPLANDS										
Holdrege silt loam <sup>2/</sup>										
62	15140:	13675:	7418:	2735:	547:	554:	937:	130:	1354	
	100:	90:	54:	20:	4:	4:	7:	1:	10	
	167360:	150624:	81712:	30125:	6024:	6099:	10320:	1431:	14913	
Colby and Nuckolls silt loam <sup>2/</sup>										
63	17881:	6258:	3344:	1108:	241:	250:	572:	63:	680	
	100:	35:	53:	18:	4:	4:	9:	1:	11	
	186880:	65408:	34945:	11584:	2523:	2613:	5978:	658:	7107	
Rough broken land										
	320:	:	:	:	:	:	:	:	:	
ALL LAND										
	100:	63:	54:	18:	4:	4:	7:	4:	9	
	458240:	286887:	154496:	52695:	10981:	11391:	19442:	10372:	27510	

<sup>1/</sup> The acres and percentages shown in the first and second lines for the soils of the bottom lands, terraces, and uplands are based on the respective samples. The percentages for cultivated land are expressed in terms of the total farm land and those for specific crops in terms of total crop land. The total acres in the third line are from the Furnas County Soil Survey Report and the other acres are derived therefrom by applying the proper percentages in the preceding line. The total acres in all land are obtained by summation and the respective percentages derived therefrom. These estimates are based on all land in the county and would be slightly lower if adjusted to farm land.

<sup>2/</sup> The percentages for Holdrege and Colby-Nuckolls silt loams were determined on a weighted basis from records for 26 and 27 farms lying entirely on the respective soil types, and from 72 records for farms having both types rather closely associated.





Since the Holdrege and Colby silt loams comprise 77 per cent of the total county area and the soils are more or less closely associated, it appeared desirable to combine (Footnote 2, Table 5) the results from records for farms lying entirely on the respective soil types and for farms on both soil types. The separate estimates were weighted in order that the ratios might be applied to all of the Holdrege and Colby (including Muckolls) mapped in the county.

The slope and erosion classifications for the soils of the uplands, which comprise more than three-fourths of the total area, are based on the land-use, soil, slope, and erosion survey of Union Township. In view of the close correlation existing between soils, slope, and erosion in this area, and the fact that Union Township is centrally located and appears to be a typical area,

the ratios obtained for Union Township may be applied to the entire county with considerable confidence. It is assumed, since fields do not ordinarily follow slope and erosion lines, that such conditions are not recognized in the cropping system.

The estimates for base or county acreages reported in Table 5 are based on the 1935 and 1936 cropping systems and all land in the county. If adjusted to farm land, they would be slightly lower. For the county as a whole, it is to be observed that these estimates are in relatively close agreement with U. S. Census and other estimates



(Table 6). It may be assumed that variations in specific crop acreages occur without respect to soil type.

#### Productivity Ratings

In order to properly evaluate the various soils and their use capabilities, it is essential to estimate their productivity. Such estimates may be in terms of general productivity, but where different crops are or should be grown because of moisture relations, slope, erosion, and other conditions, it is desirable to estimate productivity under specific uses and conditions. Average yield estimates, if based on a number of seasons and similar physical conditions would have significance. Such data, however, are not available.

The most extensive and reliable yield data available are those assembled by the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, United States Department of Agriculture. Such estimates for specific crops are based on frequent reports and are commonly weighted and adjusted to a county base. A ten-year average yield which may involve several hundred reports should, therefore, have considerable significance. Such yields represent not only average weather conditions, but all soil conditions or land types upon which the crops are grown.

It is possible, however, by using (1) average county yields and (2) estimated acreages and relative productivity by land types,

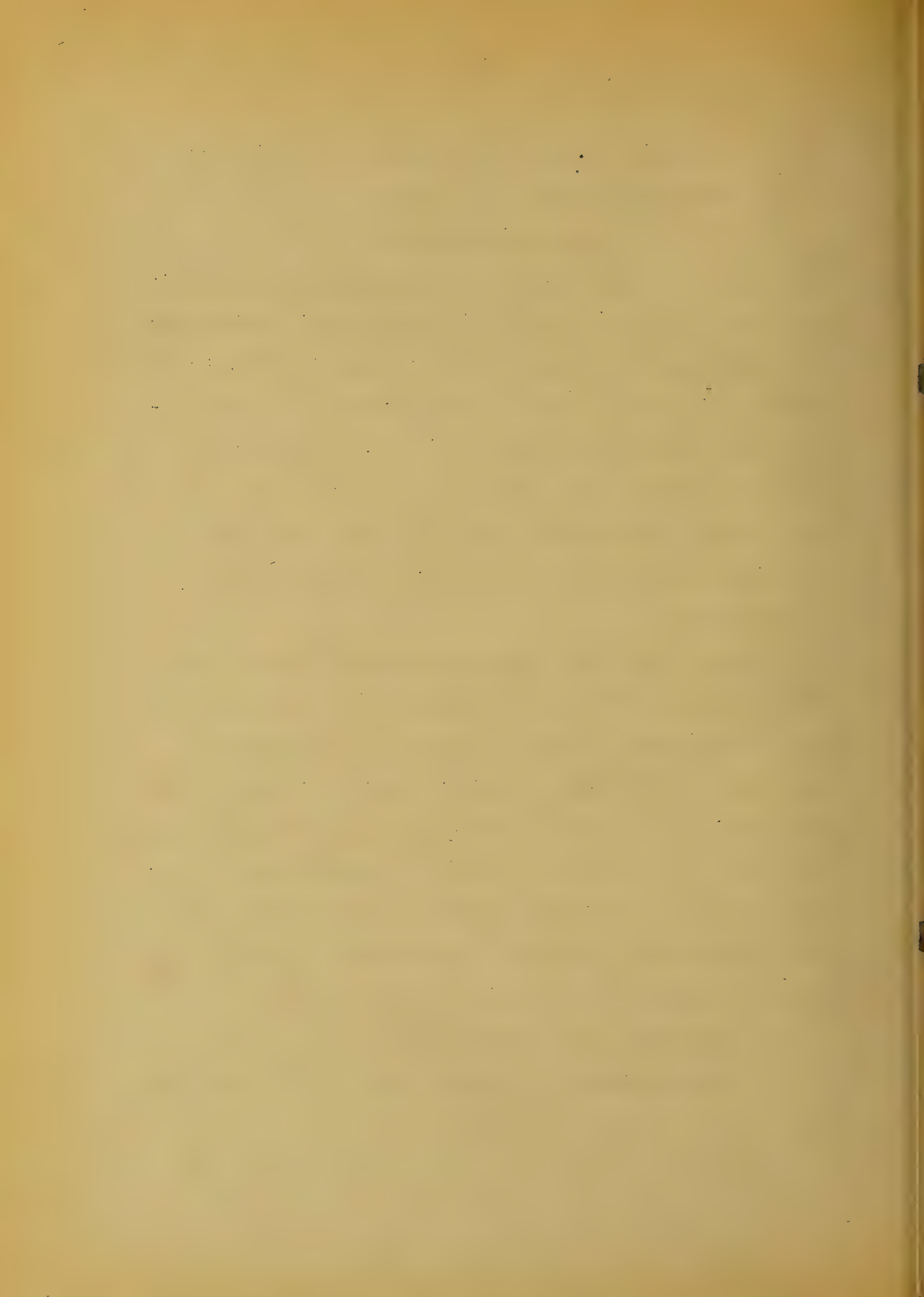


Table 6. Estimates pertaining to the utilization of all farm land in Furnas County<sup>1/</sup>

Use	U. S. Census		10-yr. average		Furnas County Agricultural Conservation Ass'n Records	
	1929		1934		1935 total	
	Acres	Per cent	Acres	Per cent	Acres	Per cent
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cultivated land						
Corn	161085	60.4			151208	139926
Wheat	60479	22.7			57005	30408
Oats	2603	1.0			2968	6819
Barley	7637	2.8			6968	9980
Sorghum	10593	4.0			24723	32858 <sup>4/</sup>
Alfalfa	8625	3.2			9364	10137
Other	15734	5.9				41883
All cultivated land	266756	60.1	271292	62.0	272011	59.5
Non-cultivated land						
Wild hay	6589	1.5	1188	.3		
Pasture	153736	34.6	148546	33.8		
Other non-crop	16967	3.8	18719	4.2		
All non-cultivated land	177292	39.9	168453	38.3	184956	40.5
All land	444048	100.0	439745	100.0	456967	100.0

<sup>1/</sup> Percentages for the respective cultivated crops are based on total crop land and other percentages are based on total land

<sup>2/</sup> Estimates supplied by the Bureau of Agricultural Economics, United States Department of Agriculture, and Nebraska Department of Agriculture, cooperating

<sup>3/</sup> Includes only grain sorghums

<sup>4/</sup> Includes other depleting crops





to calculate yields which, when weighted, will equal the estimate for gross county production. The various steps followed in deriving the productivity ratings and yields may be described briefly as follows:

1. The nineteen soil types and phases described in the Furnas County Soil Survey Report were evaluated separately, combined and/or broken down into 21 conditions or land types varying with respect to assumed productivity and use capabilities. Lamoure silt loam and Cass very fine sandy loam, both occurring on the bottom lands, were considered essentially equal and, therefore, combined. Likewise, the following six soils developed on the terraces were combined: Hall (including high terrace phase), Bridgeport, and Judson silt loams, and Hall and Bridgeport very fine sandy loams. The Colby silt loam and Nuckolls silt loam, eroded phase, were also combined. In contrast, Holdrege and Colby (including Nuckolls) silt loams developed on the uplands were broken down into eleven slope and erosion conditions.

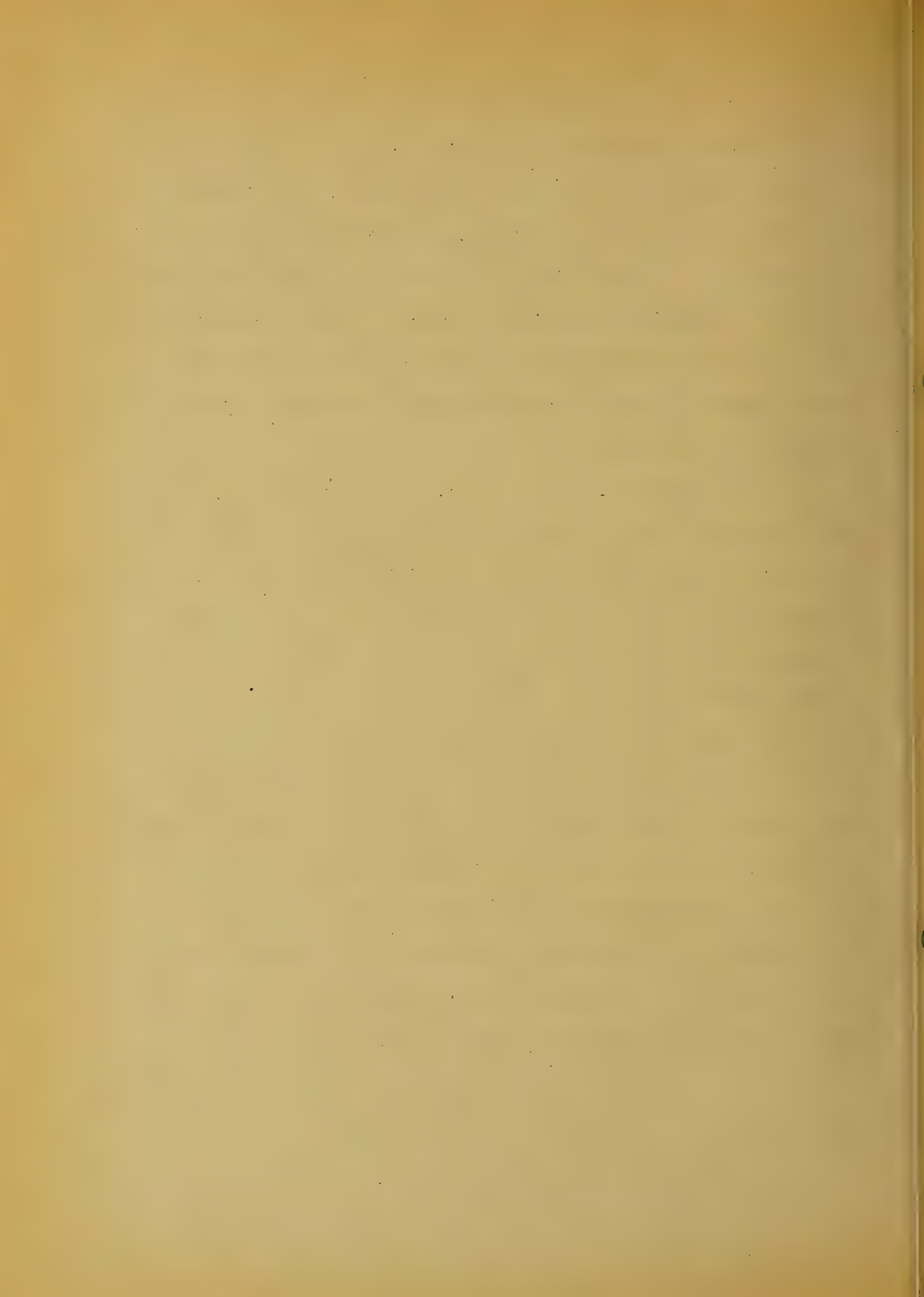
2. Based on the acreage estimates in Table 5 and slope and erosion estimates in Table 35, corn, wheat, oats, barley, sorghum fodder, alfalfa, other crop land, and all other farm land acreages were assigned to the 21 land types varying with respect to assumed productivity and use capabilities.



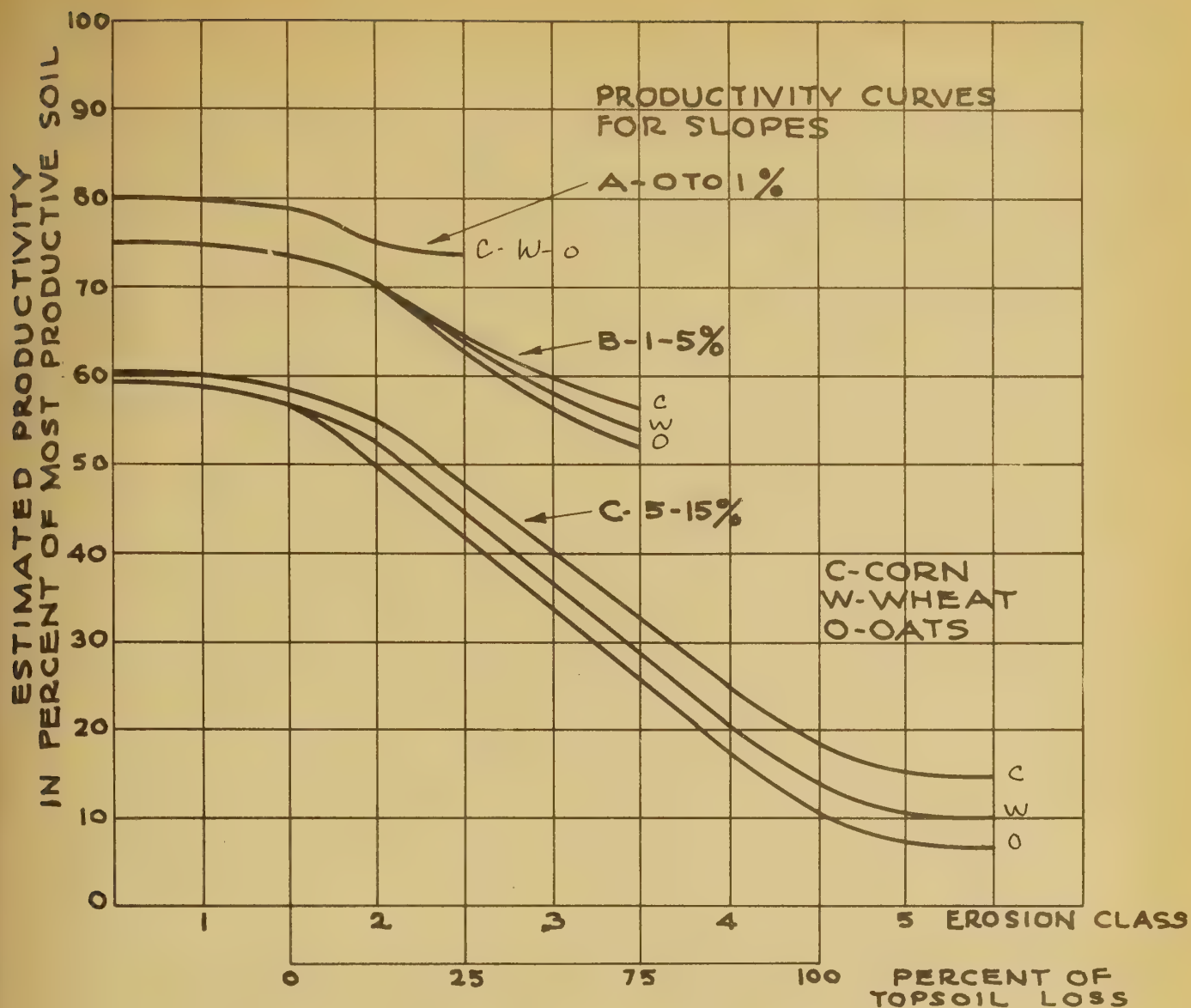
3. County production of the various crops was obtained from the assigned acreage and the average county yields. The yields estimates for corn, wheat, oats, barley, and alfalfa were supplied by the Division of Crop and Livestock Estimates and are for the ten-year period 1923-1932. Since similar county estimates for sorghum fodder and carrying capacity of pastures were not available, the opinions obtained from the farmers in Union Township were adjusted to a county base and used.

4. Relative productivity of corn, wheat, oats, barley, sorghum fodder, and alfalfa on the land types where these crops occurred was estimated in terms of the condition considered most productive. To simplify procedure, all other crop land was combined and given a weighted rating on the basis of these six crops. To further simplify procedure, all other farm land, which is primarily native grass, was combined and rated as pasture land. It is to be observed that Lamoure silt loam and Cass very fine sandy loam are rated the highest in relative terms for all uses. Under the present use pattern, however, they are not returning the highest acre yield.

Curves were constructed as an aid and guide in interpreting crop response to the variations in slope and erosion common to the soils on the uplands. Such curves for corn (and sorghum fodder), wheat, and oats (and barley) are shown in Figure 3.







**FIGURE 3. ESTIMATED PRODUCTIVITY OF SOILS ON LOESSIAL UPLAND OF FURNAS COUNTY, NEBRASKA ACCORDING TO SLOPE AND EROSION CONDITIONS**

PREPARED BY  
NEBRASKA AGRICULTURAL EXPERIMENT STATION  
IN COOPERATION WITH  
LAND USE PLANNING SECTION  
LAND UTILIZATION DIVISION  
RESETTLEMENT ADMINISTRATION-REGION-7  
UNITED STATES DEPARTMENT OF AGRICULTURE



5. Since the yield estimates for the different crops are commonly expressed in varying units, it seemed desirable to convert such estimates to a common denominator. With the exception of carrying capacity of the pastures, this has been done on the basis of total digestible nutrients and net energy (Feeds and Feeding, F. B. Morrison, 20th Ed., 1936). On the basis of one bushel of corn as one feed unit, the equivalents used for the other crops are as follows: wheat 0.9 bushel, oats 1.972 bushels, barley 1.195 bushels, sorghum fodder .069 tons, and alfalfa hay .053 tons. Six days' pasture for an animal unit was considered equivalent to one feed unit.

The limitations of this procedure are fully recognized since different feeds have varying values when fed to different kinds and types of livestock and when fed under different conditions. If carefully used, however, such conversion factors have considerable value.

Based on the above, the following productivity ratings or estimates for the various crops were derived for the twenty-one land types, for certain combinations of those types, and for the county as a whole:

- a. Relative yields expressed in terms of the land type considered most productive as 100 per cent.
- b. Acre yields expressed in bushels, tons, carrying capacity, and feed units.



- c. Relative yields for other crop land and all land expressed for the various land types in terms of the type having the highest estimated feed unit production per acre.

These ratings are shown in detail in Table 36, and are summarized in Tables 7, 8, and 9 for the soils on the bottom lands, terraces, and uplands.

With respect to relative yields (Table 7), Lamoure silt loam and Cass very fine sandy loam, the most productive soils of the bottom lands, were rated 100 for all uses. Based on the 1935-1936 use pattern, the various use ratings for all land in the county are as follows: Corn - 69.1, wheat - 67.8, oats - 66.7, barley - 67.1, sorghum (fodder) - 65.5, alfalfa - 82.0, other crop land - 68.9, permanent pasture - 59.8, and all uses - 65.5. In comparison, the range for all uses was from 83.1 to 89.3 for all soils on the bottom lands, 84.8 to 94.6 for all soils on the terraces, and 34.8 to 62.6 for all soils on the uplands.

Acre yield estimates (Table 8) under the various uses for the 100 per cent land are as follows: Corn - 29.8 bushels, wheat - 16.5 bushels, oats - 38.7 bushels, barley - 31.9 bushels, sorghum (fodder) - 2.82 tons, alfalfa - 2.55 tons, and 3.7 acres to pasture one animal unit six months. These estimates range from 22 to 65 per cent more than the average for the county. As may be observed in Table 36, the yield estimates for specific land types vary widely from those reported above.





Table 7. Estimated relative productivity of the various crops on the soils of the bottom lands, terraces, and uplands in Furnas County, Nebraska (from Table 36).

Crop	Relative productivity ratings for							
	Bottom lands		Terraces		Uplands			
	Most	pro-	Most	pro-	Hold-	Colby-		
	duc-	All	duc-	All	rege	Muckolls	All	land
	tive		tive		silt	silt		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Corn	100:87.9	90:89.8	70:	45.2:62.6	69.1			
Wheat	100:85.2	90:89.7	70:	41.5:62.1	67.8			
Oats	100:83.1	90:89.7	70:	38.5:60.7	66.7			
Barley	100:83.1	90:89.7	70:	38.5:60.6	67.1			
Sorghum (fodder)	100:87.9	90:89.8	70:	45.2:60.9	65.5			
Alfalfa	100:88.8	95:94.6	40:	23.6:34.8	82.0			
Other crop land	100:87.5	91:90.8	70:	43.6:61.5	68.9			
Permanent pasture (all other farm land)	100:89.3	85:84.8	75:	50.2:53.1	59.8			
All crops	100:88.6	90:89.8	70:	47.9:58.3	65.5			

Based on the conversion factors which were used (Table 9), acre yields for 100 per cent land expressed in feed units are as follows: Corn - 29.8, wheat - 18.3, oats - 19.6, barley - 26.7, sorghum (fodder) - 40.9, alfalfa - 47.7, all other crop land - 30.9, permanent pasture - 8.2 and all land - 17.5 (based on 1935 - 1936 use pattern).

It is to be observed that the soils on the terraces, which were given a lower relative rating than the most productive condition, have a higher feed unit estimate, 24.0 compared to 17.5. This results from



Table 8. Estimated acre yields of the various crops on the soils of the bottom lands, terraces, and uplands, in Furnas County, Nebraska (from Table 36).

Crops	Acre yields on								
	Bottom land			Terraces			Uplands		
	Most	pro-	duc-	Most	pro-	duc-	Hold-	Colby-	All
	pro-	All	duc-	pro-	All	duc-	rege	Nuckolls-	All
	duc-	All	duc-	duc-	All	duc-	silt	silt	All
	tive		tive	tive		tive	loam	loams	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
	Bushels								
Corn	:29.8:	26.2:	26.8:	26.8:	20.9:	13.5:	18.7:	20.6	
Wheat	:16.5:	14.1:	14.8:	14.8:	11.6:	6.8:	10.3:	11.2	
Oats	:38.7:	32.2:	34.8:	34.7:	27.1:	14.9:	23.5:	25.8	
Barley	:31.9:	26.5:	28.7:	28.6:	22.3:	12.3:	19.3:	21.4	
	Tons								
Sorghum (fodder)	:2.82:	2.48:	2.54:	2.54:	1.97:	1.27:	1.71:	1.85	
Alfalfa	:2.55:	2.27:	2.42:	2.41:	1.02:	0.60:	0.89:	2.09	
Carrying capacity (acres per animal unit)									
Permanent pasture									
(all other farm land)	: 3.7:	4.3:	4.3:	4.3:	4.8:	7.3:	7.1:	6.1	

the fact that a much higher percentage of the soils on the terraces is under cultivation. Undoubtedly the most effective use of land well suited to cropping is as crop land. The mere fact, however, that more feed units may be produced from land under crop than comparable land in grass is not evidence that the land should be cropped. Conservation and net return are the two factors that should be given first consideration.





Table 9. Estimated production in feed units of the various crops on the soils of the bottom lands, terraces, and uplands, in Furnas County, Nebraska (from Table 36).

Crop	Feed units per acre on <sup>1/</sup>								
	Bottom lands			Terraces			Uplands		
	Most	:	pro-	Most	:	pro-	Hold-	Colby-	:
	duc-	All	duc-	duc-	All	roge	Nuckolls-	All	ll
	tive	:	tive	tive	:	silt	silt	land	:
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Corn	29.8	:26.2	:26.8	:26.8	:20.9	13.5	:18.7	:20.6	
Wheat	18.3	:15.6	:16.4	:16.3	:12.9	7.6	:11.4	:12.4	
Oats	19.6	:16.3	:17.6	:17.5	:15.7	7.6	:11.9	:13.1	
Barley	26.7	:22.2	:24.0	:23.9	:18.7	10.3	:13.2	:17.9	
Sorghum (fodder)	40.9	:36.0	:36.9	:36.8	:28.6	18.4	:24.9	:26.9	
Alfalfa	47.7	:42.4	:45.3	:45.1	:19.1	11.2	:16.6	:39.1	
All other crop land	30.9	:27.1	:27.3	:27.2	:19.5	12.4	:17.1	:19.7	
Permanent pasture (all other farm land)	8.2	:7.3	:7.0	:7.0	:6.2	4.1	:4.3	:4.9	
All crops	17.5	:15.4	:24.0	:23.9	:18.0	7.0	:12.2	:14.2	

<sup>1/</sup> Does not include stover and straw of the corn and small grain crops

#### ECONOMIC AND SOCIAL FACTORS

The data presented in this section were obtained by means of a carefully prepared questionnaire or schedule. The schedule included questions concerning the more pertinent economic and social factors, in both the short and long time aspect. An effort was made to interview each farmer operating land in the township, and to secure information pertaining to his farm. Two hours or more were required to



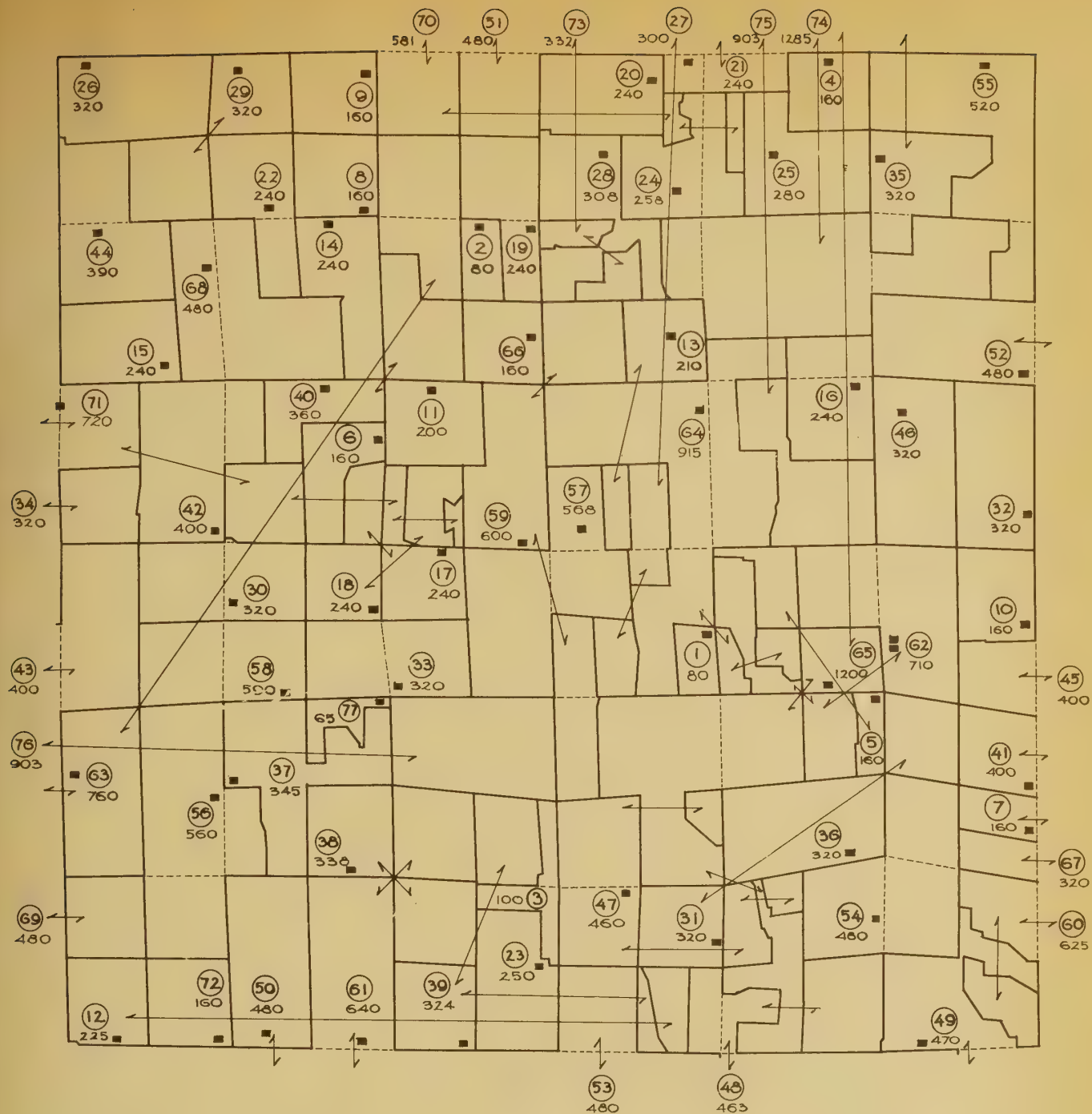
complete the rather detailed schedule. In addition, certain other data (primarily public finance) were obtained from the county courthouse records for the township, and in certain instances for the county.

Seventy-seven operating units were involved in Union Township. Fifty of the units were entirely within the township, while the other twenty-seven were only partially within the township (Figure 4). Records were obtained for 72 of the farms, but six of them were relatively incomplete. In most instances, the questions pertaining to the long time aspect were not considered unless the operator had been on the farm ten or more years. Consequently, there are a varying number of operating units involved in the tables and figures.

#### Farm Organization

Furnas County is in Type-of-Farming Area 196. The farming in this area is characterized by "Livestock, Cash Grain, and General Farming" (Figure 1). Much of the land is and should remain in native grass, thus necessitating considerable livestock specialization. Overgrazing is rather common, particularly during unfavorable seasons. On the other hand, there is a tendency to understock because of the low carrying capacity of pastures and low production of feed grains during dry seasons and the failure to carry over feed reserves from favorable years. Large amounts of feed are





**FIGURE 4. OPERATING UNIT PATTERN**  
**UNION TOWNSHIP (T.3N-R.23W)**  
**FURNAS COUNTY, NEBRASKA 1936**

PREPARED BY  
 NEBRASKA AGRICULTURAL EXPERIMENT STATION  
 IN COOPERATION WITH  
 LAND USE PLANNING SECTION  
 LAND UTILIZATION DIVISION  
 RESETTLEMENT ADMINISTRATION-REGION VII  
 UNITED STATES DEPARTMENT OF AGRICULTURE





thus shipped out during favorable years, and shipped in during unfavorable years. An increase in feed reserves would not only permit the carrying of greater numbers of livestock, but would also stabilize livestock production.

#### Size of Farm

The number, per cent, average size, and modal size of farms are shown by size groups in Table 10. Thirteen, or 17 per cent of the 77 farms have less than 200 acres, and 27, or 35 per cent, have less than 280 acres. Over 58 per cent of the farms are below the average in size. With the exception of the largest size group, the modal size increases 80 acres in each instance.

Table 10. Distribution of farms by size groups in Union Township, Furnas County, Nebraska, 1936

Size groups (acres)	Farms by groups						
	Number	Per cent	Cumulative Number	Per cent	Average size	Modal size	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
199 and under	13	17	13	17	136	160	
200 to 279	14	18	27	35	235	240	
280 to 359	18	25	45	58	319	320	
360 to 439	6	8	51	66	392	400	
440 to 519	10	13	61	79	475	480	
520 and over	16	21	77	100	755	903	
All farms	77	100			380	320	



### Cropping systems

The acres of the major crops per farm in 1935 and 1936 are presented in Table 11 for 72 farms. A more detailed analysis of crop organization is reported in Tables 37 and 38. These two tables report similar data by size groups based on total acres, and crop acres per farm.

Table 11. Utilization of land in 1935 and 1936 on 72 farms in Union Township, Furnas County, Nebraska

Use	1935		1936		2-yr. average	
	Acres	Per	Acres	Per	Acres	Per
		cent		cent		cent
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crop land (average per farm)						
Corn	130	57.8	114	50.7	122	54.2
Wheat	35	15.6	57	25.3	46	20.4
Oats	7	3.1	9	4.0	8	3.6
Barley	8	3.5	8	3.5	8	3.6
Sorghum	22	9.8	11	4.9	17	7.6
Other depleting <sup>1/</sup>	18	8.0	6	2.7	12	5.3
Conserving <sup>2/</sup>	5	2.2	20	8.9	12	5.3
Total	225	100.0	225	100.0	225	100.0
All land (average per farm)						
Crop land	225	61.1	225	61.1	225	61.1
Native pasture	122	33.2	122	33.2	122	33.2
Native hay	7	1.9	8	2.2	8	2.2
Other non-crop	14	3.8	13	3.5	13	3.5
Total	368	100.0	368	100.0	368	100.0

<sup>1/</sup> Includes rye, small grain for pasture, idle crop land, sudan hay, millet, potatoes, and other vegetables.

<sup>2/</sup> Includes alfalfa, sweet clover, other legume hay, sudan pasture, rotation pasture, and fallow. The increase in conserving crops from 1935 to 1936 was largely fallow.





The data in Table 11 indicate that approximately 61 per cent of the farm land is planted to crops, 33 per cent is native grass pasture, 2 per cent is native grass hay, and 4 per cent is waste and other land. Very little variation occurs from year to year in these proportions.

It is to be observed, however, that there is considerable variation in specific crop acreages. Based on total crop land, corn acreage decreased from 57.8 per cent in 1935 to 50.7 per cent in 1936. In contrast, wheat, the second most important crop, increased from 15.6 per cent to 25.3 per cent. Significant changes in the acreage of a number of minor crops also occurred.

The 1935, 1936, normal, and recommended acreages of four important crops are shown in Table 12 as an average of 47 farms.

Table 12. The 1935, 1936, normal, and recommended acreages of four important crops; average of 47 farms in Union Township, Furnas County, Nebraska

Year or class	Corn		Wheat		Oats		Barley	
	Acres	Per cent	Acres	Per cent	Acres	Per cent	Acres	Per cent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1935	137	99	30	59	9	90	10	100
1936	116	84	60	118	10	100	9	90
Average	127	92	45	88	9	90	9	90
Normal	138	100	51	100	10	100	10	100
Recommended	116	84	74	145	11	110	11	110



These data indicate that the corn acreage was below normal in 1936, whereas the wheat acreage was below normal in 1935 and above normal in 1936. The acreages recommended by the farmers were materially below normal for corn and above normal for wheat. Similar information is presented by size groups in Table 39.

As indicated, native permanent pasture occupies about one-third of the land in the area, thus necessitating considerable livestock specialization. Table 13 presents the farmer's opinion of the carrying capacity of the native pasture on his farm. The length of the pasture season, which averages about 5 months, varies considerable from year to year. This table

Table 13. The opinions of the operators as to the carrying capacity of native grass pastures on 62 farms by size groups in Union Township, Furnas County, Nebraska, 1936.

Size group (acres)	Number of farms	Average acres		Carrying capacity		Pasture:Feed acres per:units	
		Farm	Pasture	A.U. $\frac{1}{\text{Month}}$	Months	A.U. - 6 mo.	per acre
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
199 and under	11	138	48	10	5	5.7	5.3
200 to 279	10	236	81	17	5	5.9	5.1
280 to 359	15	318	108	23	5	6.1	4.9
360 to 439	7	395	127	20	4	8.5	3.5
440 to 519	8	474	132	20	5	8.2	3.6
520 and over	11	699	265	50	5	6.4	4.7
All farms	62	369	126	24	5	6.6	4.5

<sup>1</sup> See footnote 2, Table 14, for definition of animal unit



indicates that the pastures on the smaller farms are more heavily stocked and thus probably overgrazed to a greater extent than those on the larger farms. On the basis of 6 days' pasture for an animal unit equaling one feed unit, the pastures on the smaller farms apparently have a higher feed unit production per acre than the pastures on the larger farms. It is obvious that overgrazed pastures would have a lower production.

#### Livestock systems

Based on the U. S. Census, there were more animal units and numbers of productive livestock on farms in Furnas County in 1930 than there were in 1935 (Table 14). Similar data are not available, but it may be assumed that the same situation was true for Union Township.

As shown in Table 14, the farmers in Union Township had fewer productive livestock in 1935 than the average farmer in the county. In 1936 the productive livestock on farms in Union Township had increased above the 1935 level, but with the exception of cows and heifers was still below 1930.

Data pertaining to total and average numbers of livestock on 66 farms in the area are shown in detail in Table 40, and summarized in Table 15. These farms had an average of four head of work stock per farm. The horses were the only source of power





Table 14. Animal units of productive livestock and numbers of breeding stock per 100 acres in farms and in crops for Furnas County and Union Township<sup>1/</sup>.

Item	Animal units of		Cows and heifers		Sows and gilts							
	productive livestock <sup>2/</sup>		(2 yrs. old and over)									
	Furnas County: Union Twp.		Furnas County: Union Twp.		Furnas County: Union Twp.							
	Apr. 1:Jan. 1:Jan. 1:July 1:Apr. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:July 1		Apr. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:July 1		Apr. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:Jan. 1:July 1							
	: 1930 : 1935 : 1935 : 1936 : 1930 : 1935 : 1935 : 1936 : 1930 : 1935 : 1935 : 1936		: 1930 : 1935 : 1935 : 1936 : 1930 : 1935 : 1935 : 1936 : 1930 : 1935 : 1935 : 1936		: 1930 : 1935 : 1935 : 1936 : 1930 : 1935 : 1935 : 1936 : 1930 : 1935 : 1935 : 1936							
(1)	: (2) : (3) : (4) : (5) : (6) : (7) : (8) : (9) : (10) : (11) : (12) : (13)		: (2) : (3) : (4) : (5) : (6) : (7) : (8) : (9) : (10) : (11) : (12) : (13)		: (2) : (3) : (4) : (5) : (6) : (7) : (8) : (9) : (10) : (11) : (12) : (13)							
Per 100 acres in:												
Farms	: 8.0:	5.9:	4.4:	6.4:	2.9:	2.8:	2.3:	3.3:	1.5:	0.6:	0.2:	0.5
Crops	: 13.3:	9.6:	6.7:	10.7:	4.6:	4.6:	3.4:	5.6:	2.6:	1.1:	0.3:	0.8

<sup>1/</sup> Data in columns 5, 9, and 13 are based on 66 farm records and all other are from the 1930 and 1935 U. S. Census

<sup>2/</sup> An animal unit is assumed to be equivalent to 1 horse, 2 colts, 1 cow (2 years old and over), 2 yearlings, 2 calves, 5 hogs, or 100 chickens. Productive livestock, as used, includes all livestock except horses.



Table 15. Total livestock and average numbers of livestock  
and animal units on 66 farms in  
Union Township, Furnas County, Nebraska .

Class of livestock	: Average of July 1, 1935 and 1936		
	: 66 farms		: Average per farm
	: Numbers	: Numbers	: Animal units
(1)	(2)	(3)	(4)
Horses:			
Workstock	: 292	: 4	
Colts	: 36	: 1	
Other horses	: 16	: -	
All	: 344	: 5	5
Cattle:			
Milch cows	: 303	: 5	
Beef cows	: 324	: 5	
Calves	: 446	: 7	
Yearling heifers	: 167	: 3	
Yearling steers	: 102	: 2	
2-yr.-old heifers	: 51	: 1	
2-yr.-old steers	: 6	: -	
All other cattle	: 32	: -	
All	: 1431	: 23	16
Hogs:			
Sows and gilts	: 98	: 1	
Spring pigs	: 496	: 8	
Fall pigs	: 79	: 1	
Other pigs	: 39	: 1	
All	: 712	: 11	2
Chickens:			
Hens	: 4467	: 68	
Spring chickens	: 8218	: 124	
All	: 12685	: 192	2
All livestock			25

on some farms, and on other farms they supplemented the mechanical power. Generally, only enough colts were raised for replacement purposes.





The milch cows, which averaged five per farm, are mostly of beef breeding. In addition to these cows, the farms had an average of five other beef cows. Seven calves were raised on the average from these ten cows in 1935 and 1936, which constitutes a 70 per cent calf crop. This is low in view of such small herds.

Aside from the heifer calves retained for replacement, most of the others are sold as feeders or stockers, either as calves or as yearlings. Relatively few are fed out in the area.

There was an average of only one sow per farm. Most of the pigs are farrowed in the spring and are fed until the following winter and then sold or slaughtered for farm use. The numbers of sows and gilts on farms in the area were low in 1936, about  $1/3$  as many as the county average in 1930 (Table 14).

The flocks of chickens are not large, averaging only 68 hens per farm. In addition, an average of 124 chickens are raised on each farm per year. These are used for replacements, home consumption, or sale.

The numbers of livestock expressed in animal units and the farm and crop acres per animal unit for the 50 farms for which normal livestock numbers were reported are presented in summary form in Table 16. As an average, there were 12.9 acres per animal unit in 1935 and 1936 compared to a normal of 11.7 acres. The same information is presented by size groups in Table 41. These data indicate



that with the exception of the largest size group the farms normally have more livestock than they had in 1935 and 1936.

Table 16. Kind and number of animal units (1935-36 and normal) and the farm and crop acres per animal unit on 50 farms in Union Township, Furnas County, Nebraska

Item	:	Average of	:	Normal
	:	1935 and 1936	:	
(1)	:	(2)	:	(3)
Animal units				
Horses	:	5.4	:	6.7
Cattle	:	19.6	:	17.7
Hogs	:	2.5	:	4.2
Poultry	:	2.1	:	2.2
Total	:	29.6	:	30.8
Acres per animal unit in:				
Farm	:	12.9	:	11.7
Crops	:	7.9	:	

#### Farm labor

The amount of labor normally used for farm work is shown by size groups in Table 17. The average labor requirement for these 66 farms is 17.2 months. This includes 11.3 months of labor by the operator, 4.7 months of family labor, and 1.2 months of hired labor. Although the amount of labor does not increase proportionately with the size of farm, there is a consistent increase in labor requirement with increase in size of farm. Excepting the largest size group, this increase is principally in family labor rather than hired labor.



Table 17. The relation between size of farm and labor requirement  
on 66 farms in  
Union Township, Furnas County, Nebraska

Size group (acres)	Number: : of : farms	Acres : : usually : operated	Months of labor per farm Operator	Family		Hired	Total
				Male	Female		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
199 and under	11	152	10.9	1.6	0.2	0.1	12.8
200 to 279	15	236	11.3	1.0	1.2	0.7	14.2
280 to 359	15	320	10.7	2.7	2.1	0.6	16.1
360 to 439	8	395	11.9	5.2	0.1	-	17.2
440 to 519	9	478	11.9	5.3	3.4	1.1	21.7
520 and over	8	664	12.0	7.8	0.4	6.1	26.3
All farms	66	345	11.3	3.4	1.3	1.2	17.2

#### Farm Ownership and Tenure

Ownership and tenancy relations are frequently so closely associated that they cannot be clearly separated. Correct land use is equally dependent on the development of a proper appreciation of the physical, economic, and social factors by both owners and tenants, and the establishment of satisfactory owner-tenant relations.

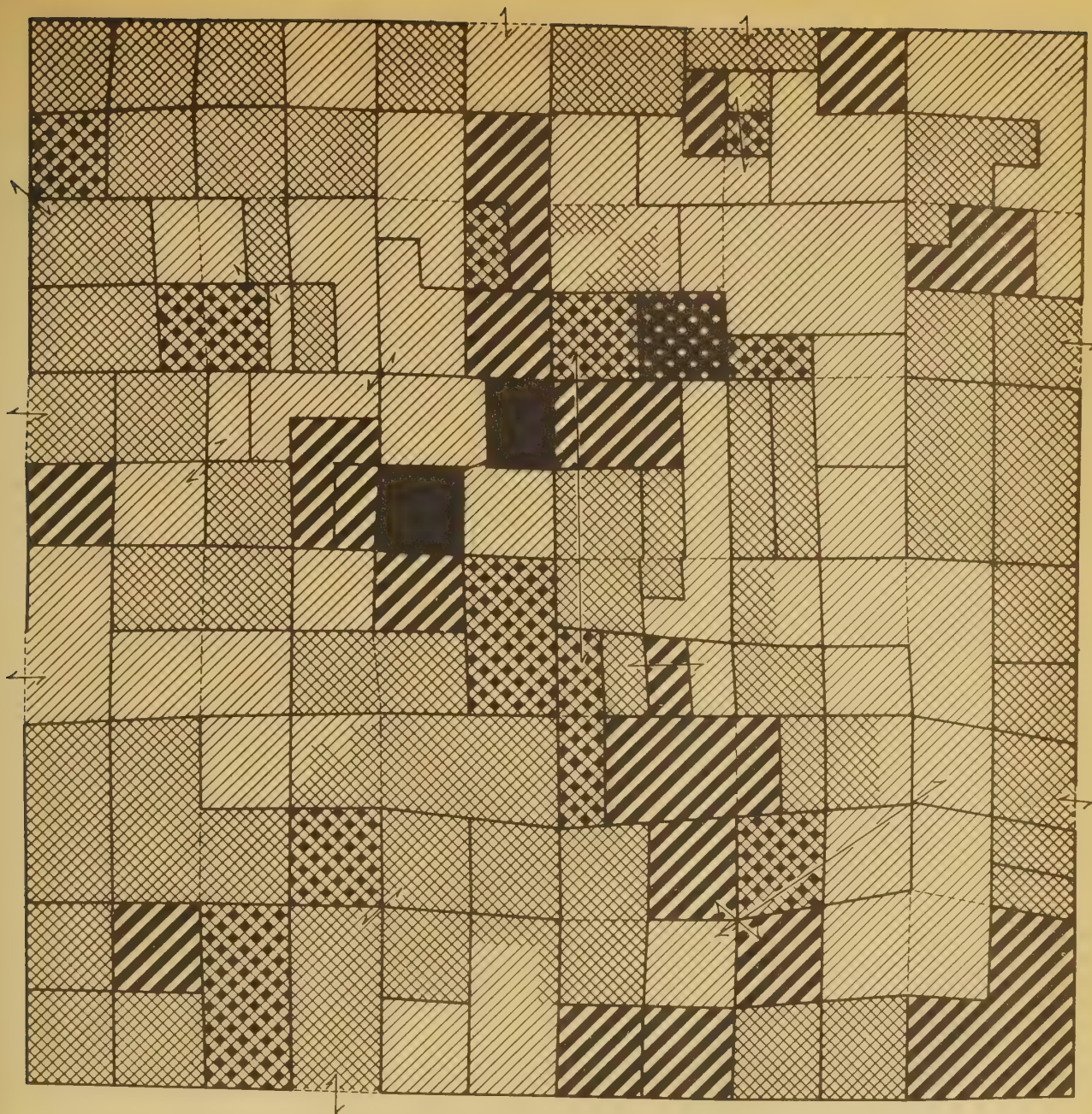
#### Type of ownership

The ownership data as obtained from the assessor's records for 1936 are shown in Table 18 and in Figure 5.

Aside from three tracts involving 440 acres, the land in the area was privately owned. With respect to type of ownership, 53.8 per cent was owned by the operator, 41.9 per cent by individuals living in Furnas or adjoining counties, 8.0 per cent by










## LEGEND

### TYPES OF OWNERSHIP

	OWNER OPERATED		PARTNERSHIPS, TRUSTEESHIPS, AND ESTATES
	OWNER LIVING WITHIN COMMUNITY		COMMERCIAL BANKS
	OWNER LIVING WITHOUT COMMUNITY		STATE SCHOOL LAND

### SYMBOLS

	OWNERSHIP UNIT BOUNDARY
	SECTION LINE
	CONNECTING NON-CONTIGUOUS TRACTS

SCALE OF MILES

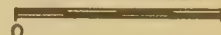


FIGURE 5. OWNERSHIP PATTERN  
UNION TOWNSHIP (T.3N.-R.23W.)  
FURNAS COUNTY, NEBRASKA, 1936

PREPARED BY  
NEBRASKA AGRICULTURAL EXPERIMENT STATION  
IN COOPERATION WITH  
LAND USE PLANNING SECTION  
LAND UTILIZATION DIVISION  
RESETTLEMENT ADMINISTRATION-REGION VII  
UNITED STATES DEPARTMENT OF AGRICULTURE







absentee owners, and 14.4 per cent by partnerships, trusteeships, and estates, or a total of 98.1 per cent owned by private individuals.

A quarter section of the 440 acres non-privately owned land was held by a commercial bank, and the other 280 acres were state school land. It is to be observed that the ownership data cover only the area within Union Township and involve all or parts of the 77 farms.

Table 18. Extent and proportion of land  
held by types of owners  
Union Township, Furnas County, Nebraska, 1936

Type of ownership	: Acres	: Per cent
(1)	: (2)	: (3)
Private		
Owned by operator	: 7789	: 33.8
Owner living within community	: 9646	: 41.9
Owner living without community	: 1840	: 8.0
Partnership, trusteeship, and estate	: 3320	: 14.4
Corporate and public		
Commercial bank	: 160	: 0.7
State school land	: 280	: 1.2
Total	: 23035	: 100.0

### Type of tenure

The type of tenure as reported by the farmers is summarized in Table 19. These data are for all land in the 77 farms and thus include land not within the township.





Table 19. Type of tenure on 77 farms entirely or partly within Union Township, Furnas County, Nebraska, 1936

Type of tenure	Farms		Owner-operated		Tenant-operated	
			land		land	
	Number	Per cent	Acres	Per cent	Acres	Per cent
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Full owner	16	20.8	5053	16.9		
Part owner	16	20.8	5049	16.8	4015	13.4
Tenant	45	58.4			15866	52.9
Total	77	100.0	10102	33.7	19881	66.3

Sixteen farms, or 20.8 per cent, are operated by full owners; a like number are operated by owners who rent additional land; and 45 farms, or 58.4 per cent are operated solely by tenants. Approximately one-third of the land is owner-operated, and two-thirds is tenant-operated. The full owners, part owners, and tenants operate 16.9, 30.2, and 52.9 per cent of the area, respectively. With respect to that operated by part-owners, their owner-operated land constituted 16.8 per cent and their tenant-operated land 13.4 per cent of the total area.

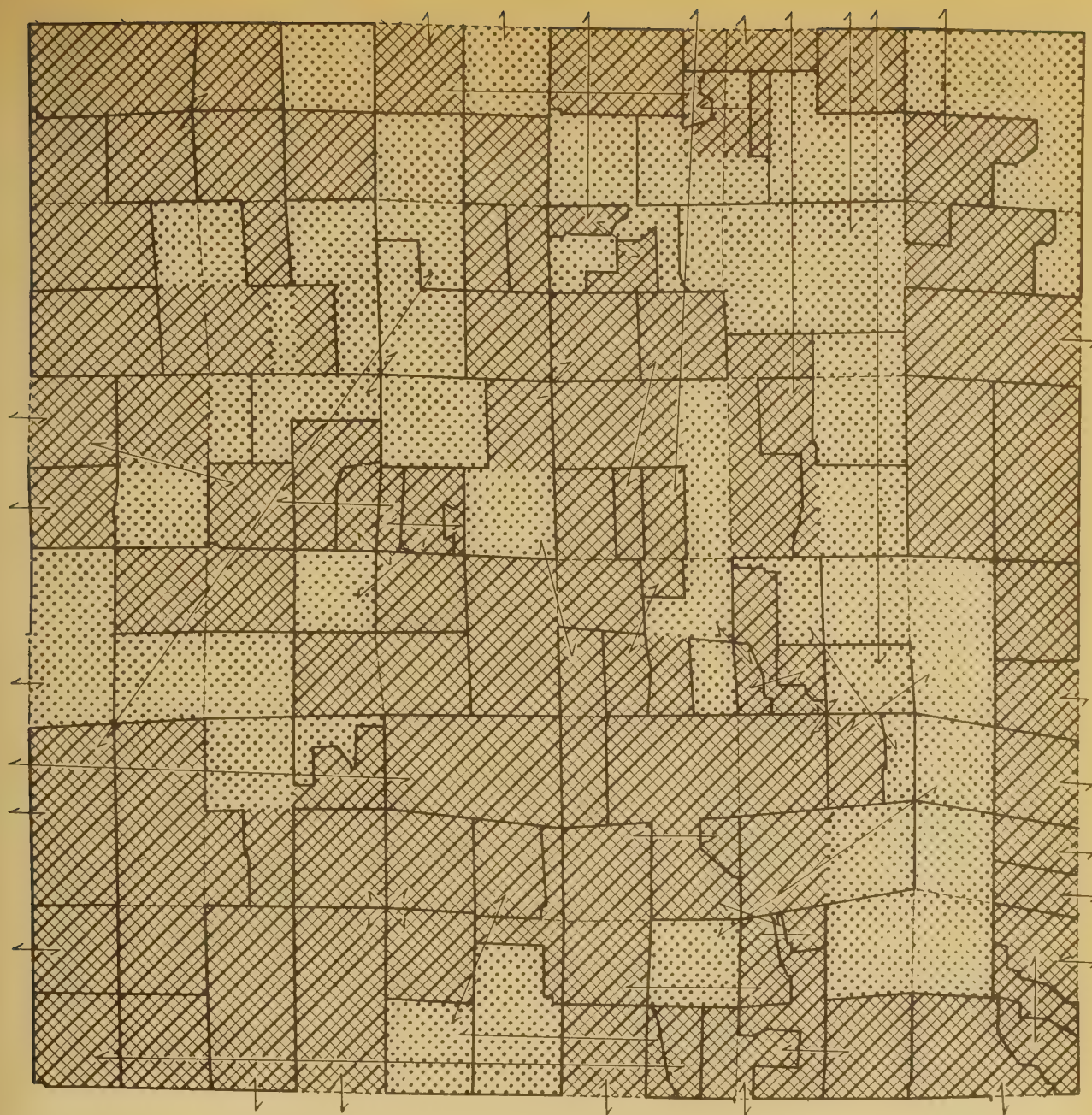
Operating unit patterns of Union Township are shown in Figures 6 and 7 for 1936 in relation to type of tenure and ownership.

#### Financial Conditions

The following financial conditions were studied: (1) real estate mortgages, (2) chattel mortgages, (3) tax delinquency, (4) rural school finance, and (5) financial progress of 27 farmers. The rural school data in part are presented on a county basis.







# L E G E N D TYPE OF TENURE



OWNER OPERATED

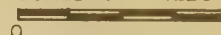


TENANT OPERATED

## SYMBOLS

- OPERATING UNIT BOUNDARY
- - - SECTION LINE
- ↔ CONNECTING NON-CONTIGUOUS TRACT

SCALE OF MILES



## FIGURE 6. OPERATING UNIT PATTERN

BASED ON TYPE OF TENURE

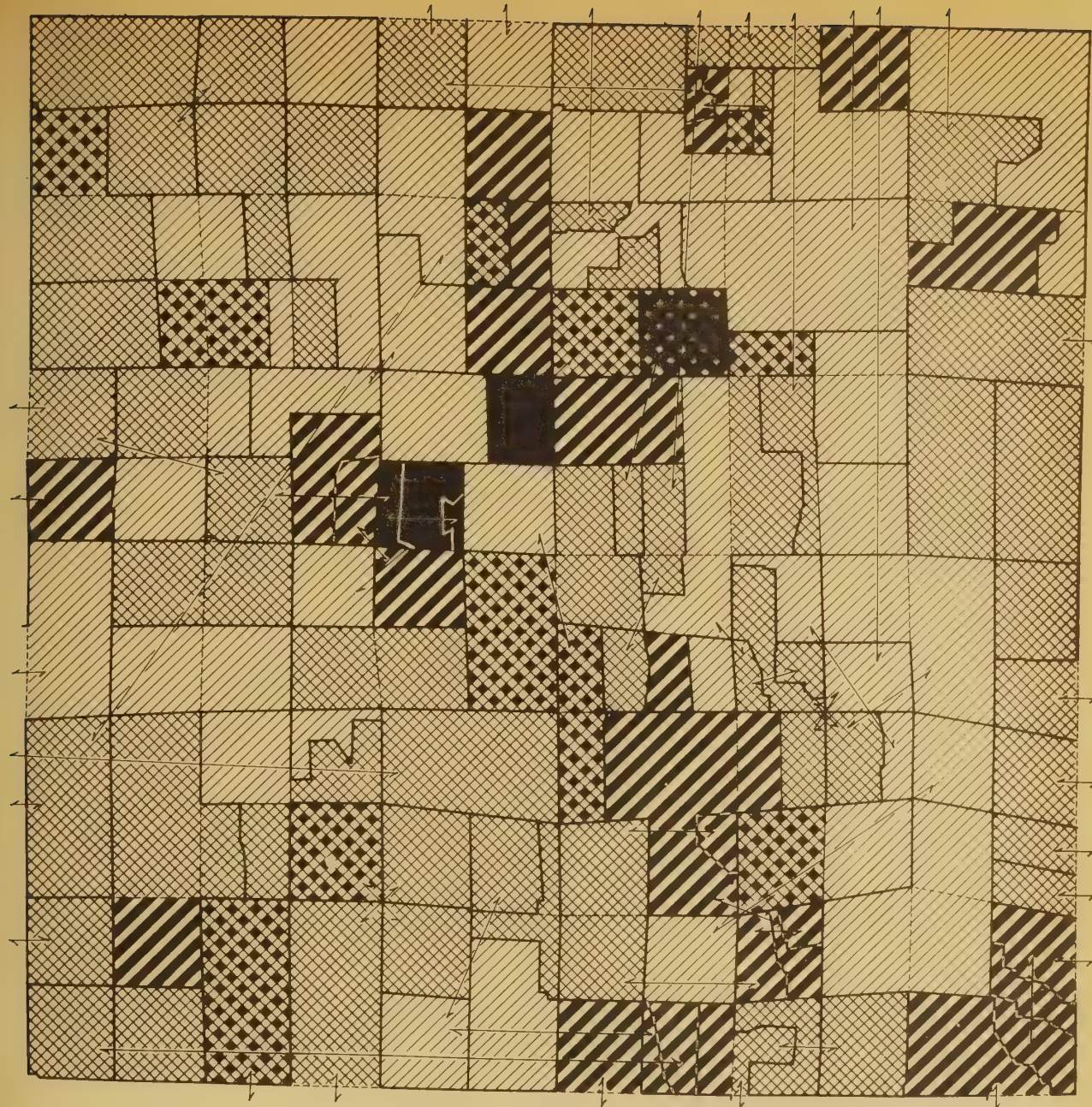
UNION TOWNSHIP T.3N. - R.23W  
FURNAS COUNTY, NEBRASKA 1936

PREPARED BY  
NEBRASKA AGRICULTURAL EXPERIMENT STATION  
IN COOPERATION WITH  
LAND USE PLANNING SECTION  
LAND UTILIZATION DIVISION  
RESETTLEMENT ADMINISTRATION-REGION VII  
UNITED STATES DEPARTMENT OF AGRICULTURE


















## LEGEND

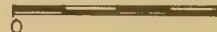
### TYPES OF OWNERSHIP

	OWNER OPERATED		PARTNERSHIPS, TRUSTEESHIPS, AND ESTATES
	OWNER LIVING WITHIN COMMUNITY		COMMERCIAL BANKS
	OWNER LIVING WITHOUT COMMUNITY		STATE SCHOOL LAND

### SYMBOLS

	OPERATING UNIT BOUNDARY
	SECTION LINE
	CONNECTING NON-CONTIGUOUS TRACT

SCALE OF MILES



**FIGURE 7. OPERATING UNIT PATTERN  
BASED ON TYPE OF OWNERSHIP  
UNION TOWNSHIP (T.3N.-R.23W)  
FURNAS COUNTY, NEBRASKA 1936**

PREPARED BY  
NEBRASKA AGRICULTURAL EXPERIMENT STATION  
IN COOPERATION WITH  
LAND USE PLANNING SECTION  
LAND UTILIZATION DIVISION  
RESETTLEMENT ADMINISTRATION-REGION VII  
UNITED STATES DEPARTMENT OF AGRICULTURE







Real estate mortgages

There was a recorded mortgage on 36.3 per cent of the land in the township. While this proportion is not high, the mortgaged land carries a relatively heavy burden compared to present sale values. The 39 first mortgages averaged \$13.22 per acre. In addition, there were eight second mortgages covering 9.6 per cent of the land. These second mortgages averaged \$5.66 per acre, making a total mortgage indebtedness of \$18.72 for this land. The range in indebtedness for individual farms was from \$6.25 to \$30.75 per acre.

As shown in Table 20, 40.6 per cent of the first mortgages were held by private individuals, 9.6 per cent by loan or insurance companies, 2.9 per cent by commercial banks, 44.5 per cent by the Federal Land Bank, and 2.4 per cent by the Land Bank Commissioner.

Table 20. Extent of real estate mortgages on record and proportion held by different types of mortgagees, Union Township, Furnas County, Nebraska, 1936

Type of mortgagee	First mortgages				Second mortgages <sup>1/</sup>			
	Num-	Acres	Amount		Num-	Acres	Amount	
	ber	Number	Per cent	per acre	ber	Number	Per cent	per acre
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total	39	8358	100.0	\$13.22	8	2200	100.0	\$5.66
Private	19	3398	40.6	14.22				
Loan and insurance companies	4	800	9.6	18.38				
Commercial bank	2	240	2.9	17.08	1	320	14.5	8.25
Federal Land Bank	13	3720	44.5	10.55				
Federal Land Bank Commissioner	1	200	2.4	20.50	7	1880	84.5	5.21

<sup>1/</sup> With respect to the eight tracts carrying a second mortgage, a loan and insurance company holds one first mortgage and the Federal Land Bank the other seven.



With one exception, all second mortgages were held by the Land Bank Commissioner, and covered land on which the Federal Land Bank held the first mortgage.

### Chattel mortgages

The recorded chattel mortgage indebtedness of the 61 farmers living in Union Township is summarized by size groups in Table 21.

Table 21. The relation between size of farm and the chattel mortgages of the 61 farmers living in Union Township, Furnas County, Nebraska, 1936.

Size group (acres)	Total operators	Operators who are mortgagors			
		Number	Av. acres operated	Chattels mortgaged per farm	per acre
(1)	(2)	(3)	(4)	(5)	(6)
199 and under	13	5	131	\$ 640.39	\$ 4.87
200 to 279	13	6	231	\$ 663.83	\$ 2.87
280 to 359	14	4	321	\$ 1067.43	\$ 3.32
360 to 439	4	2	395	\$ 509.91	\$ 1.29
440 to 519	6	4	472	\$ 1279.65	\$ 2.71
520 and over	11	5	831	\$ 1144.27	\$ 1.38
All farms	61	26	391	\$ 896.71	\$ 2.29

Twenty-six, or 43 per cent, of the operators had an average personal indebtedness of \$896.71. Compared to the smaller operators, there was a tendency for more of the larger operators to have chattel indebtedness. Although the average debt of the larger operator was greater, it averaged less per acre.





Twenty-two of the 26 chattel mortgagors were tenants and their chattels amounted to \$2.62 per acre of land operated. The other four were owner-operators or part owners, and their chattel mortgages averaged \$1.14 per acre. In addition, all four owners or part owners had real estate mortgages on their land averaging \$11.35 per acre. Fifteen of the thirty five operators who have no chattel mortgages are tenants, 14 are owners or part owners who have no real estate mortgage, and 6 are owners or part owners who have a real estate mortgage on their land.

#### Tax delinquency

As indicated in Table 22, real estate tax delinquency is not a serious problem. Such taxes, however, are not always paid prior to delinquency. During the nine-year period 1926 to 1934 the highest delinquency occurred in 1932, when 56 per cent of the land and 54 per cent of the taxes became delinquent. The lowest delinquency occurred in 1928 with 32 per cent of the taxes and land delinquent.

In general, the taxes do not remain delinquent for any considerable period. None of the taxes levied in 1927 and 1929 remained delinquent a year. In 1926 less than one-half of one per cent, and in 1928 two per cent of the taxes were delinquent for a year or longer. After 1929, the proportion of the taxes remaining delinquent a year or longer increased each year until it reached 18 per cent

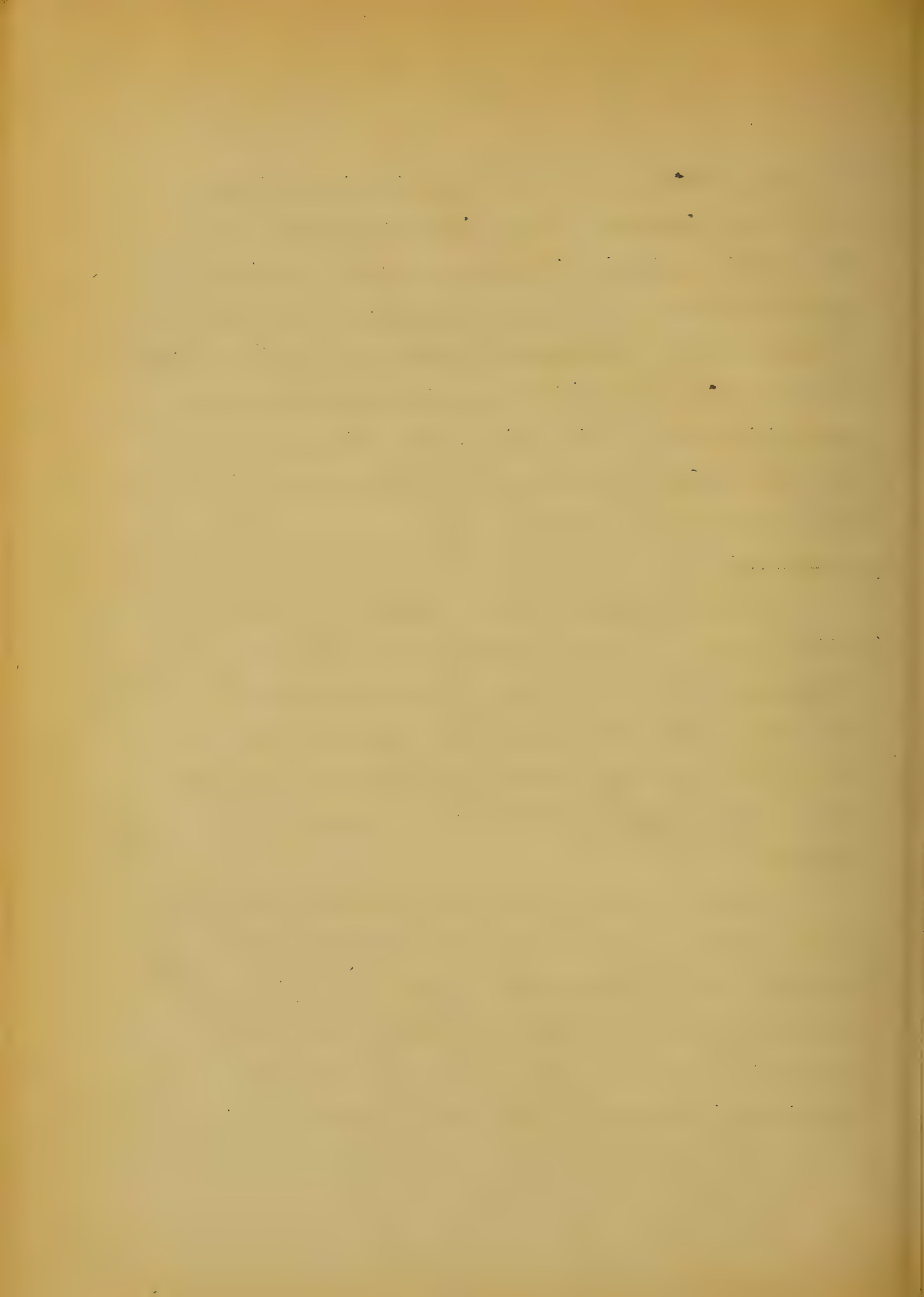


Table 22. Delinquent real estate tax summary for the years 1926 to 1935 in Union Township, Furnas County, Nebraska

Year	Total tax levied	Unpaid taxes											
		on delinquency date <sup>1/</sup>						1 yr. after delinquency date: accrued as of July 1, 1936					
		Amount	Land	%	Acres	Amount	%	Land	%	Acres	Amount <sup>2/</sup>	%	Land
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1926:	6,983.74	2,633.03	38	9,040	40	27.00	-	80	-	-	-	-	-
1927:	8,694.88	3,283.62	38	8,680	38								
1928:	8,600.39	2,737.11	32	7,240	32	165.07	2	480	2				
1929:	8,654.59	3,603.11	42	9,680	43								
1930:	7,814.80	2,972.66	38	8,680	38	290.83	4	880	4				
1931:	8,298.52	3,429.49	41	9,240	41	485.15	6	1,240	5				
1932:	6,885.56	3,734.94	54	12,760	56	936.03	14	3,360	15	335.55	5	880	4
1933:	6,544.47	3,331.17	51	12,840	56	1,141.17	17	4,440	20	842.15	6	2,080	9
1934:	5,534.12	2,155.05	39	10,360	46	1,011.28	18	4,600	20	1,853.43	10	4,600	20
1935:	5,885.24	1,219.91	21	9,320	40					2,990.69	12	8,680	38

<sup>1/</sup> For 1931 and prior years the real estate taxes became delinquent on May 1st. In 1932 they became delinquent on July 1st. In 1933 and 1934 the delinquency date was March 1st, unless one-half of the taxes had been paid, in which instance the last half became delinquent on August 1st. In 1935 one-half of the real estate taxes became delinquent on May 1st and the other half September 1st.

<sup>2/</sup> The per cent of accrued delinquency is based on the taxes levied since 1932, and approximately one-third of the taxes delinquent in 1935 had not been delinquent over two months.



in 1934. On July 1, 1936, there were approximately \$3000 in delinquent real estate taxes. They covered a four-year period from 1932 to 1935, and constituted 12 per cent of the total taxes levied during the four years. Slightly more than  $1/3$  of these delinquent taxes were for the year 1935 and had been delinquent only a short time.

The frequency of tax delinquency is summarized in Table 23. Taxes on twenty-three of the 150 assessed tracts never became delinquent during the 9-year period 1926 to 1934. In contrast, those on nine tracts were delinquent each of the nine years. Although 45 per cent of the assessments became delinquent, it would appear that delinquency in this area results from the failure to meet obligations promptly and from the lack of readily available funds, rather than inability to pay.

#### Rural school finance

Since they are possibly related to tax delinquency and inequalities in assessment, it appeared desirable to examine total and relative assessments and tax levies. In view of the fact that the rural school levies constitute approximately one-half of the total levies and are the only levies under local control, rural school finances are presented in considerable detail. Rural levies in Furnas County include only school, county, and state levies. All assessments are equalized to a county base.





Table 23. Tax delinquency frequency from 1926 to 1934  
for the 150 assessed tracts of land in  
Union Township, Furnas County, Nebraska

Years	:	Total number of <sup>1/</sup>	
delinquent	:	Assessment tracts :	Delinquencies
(1)	:	(2)	(3)
0	:	23	0
1	:	20	20
2	:	11	22
3	:	14	42
4	:	14	56
5	:	18	90
6	:	11	66
7	:	13	91
8	:	17	136
9	:	9	81
Total	:	150	604

<sup>1/</sup> 1350 assessments were made on the 150 tracts during the nine-year period 1926 to 1934

There are 93 rural school districts in Furnas County (Figure 8), eight of which are entirely or partly within Union Township. The ratios between the yearly and average valuation of real estate and the levy for school purposes are reported in Table 24 for the eight districts involved in Union Township for the ten-year period 1926 to 1935. In general, the tendency is for the levy to go up when the valuation goes down, although there are instances in which both valuation and levy go down.

In 1930 the total average valuation and levy of those districts was 140,244 and 6.625 mills. This would produce \$929.12 for school



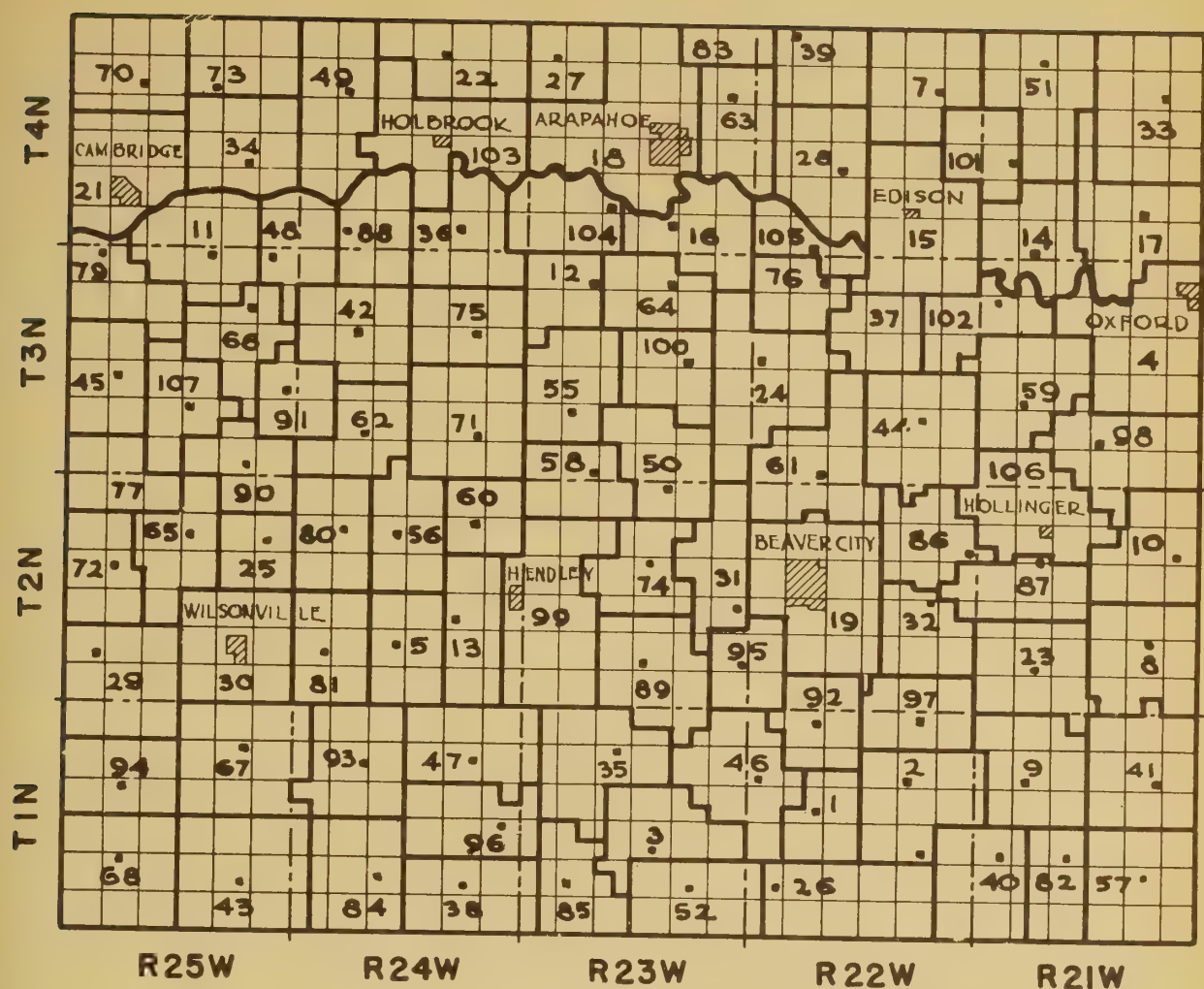


FIGURE 8. SCHOOL DISTRICT PATTERN  
FURNAS COUNTY, NEBRASKA, 1936

PREPARED BY  
NEBRASKA AGRICULTURAL EXPERIMENT STATION  
IN COOPERATION WITH  
LAND USE PLANNING SECTION  
LAND UTILIZATION DIVISION  
RESETTLEMENT ADMINISTRATION - REGION 7  
UNITED STATES DEPARTMENT OF AGRICULTURE





Table 24. The real estate valuations and school levies for the years 1926 to 1935 expressed in percentages of the respective 10-year averages for the eight school districts entirely or partly within Union Township, Furnas County, Nebraska

School	:	:	:	:	:	:	:	:	:	:	:	:	
District:Item	:	1926:	1927:	1928:	1929:	1930:	1931:	1932:	1933:	1934:	1935		
number	:	:	:	:	:	:	:	:	:	:	:	:	
(1)	:	(2)	:	(3):	(4):	(5):	(6):	(7):	(8):	(9):	(12):	(11):	(12)
12	:Val.	:	115:	115:	115:	115:	111:	111:	92:	77:	74:	74	
	:Levy	:	69:	106:	106:	85:	95:	95:	99:	116:	116:	112	
16 <sup>1/</sup>	:Val.	:	116:	116:	116:	116:	110:	110:	91:	74:	74:	74	
	:Levy	:	126:	32:	95:	47:	95:	111:	126:	118:	117:	133	
24 <sup>1/</sup>	:Val.	:	116:	116:	116:	116:	112:	112:	93:	73:	71:	73	
	:Levy	:	74:	74:	102:	102:	84:	99:	65:	139:	119:	141	
50 <sup>1/</sup>	:Val.	:	117:	117:	117:	117:	111:	110:	92:	74:	73:	74	
	:Levy	:	40:	63:	95:	111:	111:	119:	111:	143:	105:	102	
55	:Val.	:	117:	118:	117:	117:	109:	109:	91:	74:	74:	74	
	:Levy	:	69:	76:	107:	69:	91:	116:	95:	122:	128:	128	
58 <sup>1/</sup>	:Val.	:	114:	114:	114:	114:	112:	112:	93:	75:	75:	75	
	:Levy	:	68:	124:	124:	118:	87:	100:	113:	114:	72:	79	
64	:Val.	:	116:	116:	116:	116:	112:	111:	92:	73:	73:	74	
	:Levy	:	35:	69:	118:	124:	97:	122:	91:	145:	83:	116	
100	:Val.	:	116:	116:	116:	116:	110:	110:	92:	75:	75:	75	
	:Levy	:	61:	122:	122:	114:	99:	125:	122:	106:	46:	55	

<sup>1/</sup> Valuations are based on the real estate lying within Union Township. No general school levy was made in the following instances: District 16 in 1927, Districts 50 and 64 in 1926, and District 100 in 1934 and 1935. The levies in these instances were for free high school tuition.



purposes. Comparable data for 1935 are: Valuation \$86,029, levy 7.475 mills, and estimated income \$643.07. It is to be observed that the levy is for all school purposes, including the county levy for free high school tuition.

The total assessed valuation, the percentage distribution of the valuation into personal, real estate, and public utilities, the levy for school purposes, and the ratio between the levy for school purposes and the total levy for all 93 rural schools in Furnas County are shown in Table 42 and summarized in Table 25 for the years 1930 and 1935.

Table 25. Average 1930 and 1935 valuations and their distribution into personal, real estate, and public utilities, and school, county, and state levies, for the 93 rural school districts in Furnas County, Nebraska

	Assessed valuation of property				Levy in mills			Ratio
Year	Percentage distribution							school
	Total	Personal	Real Estate	Public Utilities	School	County	State	to total
	(dollars)							levy
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1930:	160475	17	73	10	6.6	3.70	2.34	52.4
1935:	99717	11	81	8	8.4	4.70	2.25	54.9

As an average for the 93 districts, total assessed valuations decreased from \$160,475 per district to \$99,717, or 38 per cent. The decreases ranged from 50 per cent to 26 per cent. The district levies



averaged 6.6 mills in 1930 and ranged from 3.5 to 9.0 mills for those districts having a general school levy. In 1935 the average levy was 8.4 mills and ranged from 5.2 to 13.6 mills.

The county levy was 3.7 mills in 1930 and 4.7 mills in 1935. In comparison the state levy was 2.34 and 2.25 mills, respectively. As an average for the 93 districts, the school levy constituted 52.4 per cent of the total levy in 1930 and 54.9 per cent in 1935. Excluding those districts which had only the county levy for free high school tuition, the school levies constituted from 36.7 to 59.8 per cent of the total levies in 1930, and from 42.8 to 66.2 per cent in 1935.

As an average for the 93 districts in 1930, 17, 73, and 10 per cent of the assessed property was personal, real, and public utility. Similar percentages in 1935 were 11, 81, and 8. Railroads pass through 17 districts, and in these districts public utilities constituted from 10 to 55 per cent of the total assessed property. In most of the other districts, public utilities contributed one per cent or less, yet the people in these districts probably support the public utilities, particularly the railroads, to the same extent as the people residing in districts having the utilities. It would appear that taxes derived from such utilities could and should be apportioned on a more equitable basis.





### Financial progress

It was hoped, by securing financial progress statements from farmers, to measure the earning capacity of their farms. If a significant sample could be obtained, it was believed that this would be a fair measure of all factors entering into the farm business. While the net change in capital, after segregating non-farm income and losses, may not be an absolute measure, it would give some indication of the earning capacity of the farm.

The average financial progress statement of 27 farmers is shown in detail in Table 43, and summarized in Table 26. These data

Table 26. Relation between size of farm and change in net worth of 27 farmers in Union Township, Furnas County, Nebraska

Size group (acres)	:	Number of Farms	:	Years (average)	:	Change in net worth (dollars) based on average per Farm (annual)	:	Farm year
(1)	:	(2)	:	(3)	:	(4)	:	(5)
199 and under	:	2	:	4.5	:	-144	:	-197
200 to 279	:	4	:	26.0	:	105	:	184
279 and under	:	6	:	18.8	:	22	:	154
280 to 359	:	7	:	14.9	:	264	:	254
360 to 439	:	4	:	28.8	:	164	:	174
280 to 439	:	11	:	19.9	:	228	:	213
440 to 519	:	5	:	19.6	:	243	:	126
520 and over	:	5	:	23.0	:	712	:	660
440 and over	:	10	:	21.3	:	477	:	425
All farms	:	27	:	20.2	:	275	:	285



were obtained from relatively few farmers because many of them had not been on the farms they are now operating sufficient time to give significance to such data. Based on the farmers' statements as to the original assets and liabilities, their estimate of additional funds put into or taken from the farm business, and their present assets and liabilities, it appears that the farms have furnished little more than a living. The average increase in capital for the 27 farms was \$275 or \$283 per year, depending on the method of calculation. The most significant change in net worth - an increase of \$712 or \$680 per year - occurred in the the largest size group.

#### Social Factors

##### Age and education

There is little or no relation between the size of farm and age of the farm operators and women (Table 27), but the former averaged four years older than the latter. On the average there were three children per family with two living at home. The children at home averaged 13 years of age.

The education of the farm operators ranged from no schooling to a college education (Table 28). The majority of both the farm operators and women had a common school education, but the latter on the average had a year more schooling than the former. The





data indicate that little or no relation exists between their education and the size of farm they are now operating.

With respect to the children over 18 years of age, however, there was a tendency for the children raised on the larger farms to have had more years of schooling. It is likely that the educational experience of the younger children will exceed that of the older children.

Table 27. Relation between the size of farm and the ages of farm operators, farm women, and their children living at home on 64 farms in

Union Township, Furnas County, Nebraska, 1936

Size group (acres)	Number of farms	Ages of				Average number		
		Farm operators		Farm women		of children		
		Range		Range		In	Living on farm	
		Range	Mean	Range	Mean	family	Number	Age
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
279 and under	23	22-70	46	20-65	41	3	2	11
280 to 439	22	23-75	45	22-71	44	3	1	17
440 and over	19	29-66	47	22-65	41	3	2	13
All farms	64	22-75	46	20-71	42	3	2	13



Table 28. Relation between the size of farm and the education of farm operators and women and their children over 18 years of age on 64 farms in Union Township, Furnas County, Nebraska, 1936.

Size group (acres)	Number of farms	Education (in years) of								
		Farm operators			Farm women			Children over eighteen <sup>1/</sup>		
		Range	Mode	Mean	Range	Mode	Mean	Range	Mode	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
279 and under	23	4-17	8	9	0-16	8	9	4-12	8	9
280 to 439	22	0-13	8	8	0-12	8	9	8-17	8	10
440 and over	19	3-13	8	9	8-14	8	10	8-16	12	11
All farms	64	0-17	8	9	0-16	8	10	4-17	8	10

<sup>1/</sup> Based on a total of 73 children, or 18, 27, and 28, respectively by size groups. In the second group, one abnormal child was excluded.

### Classification of farmsteads

As a part of the physical survey, the farmsteads were classified according to the following standards:

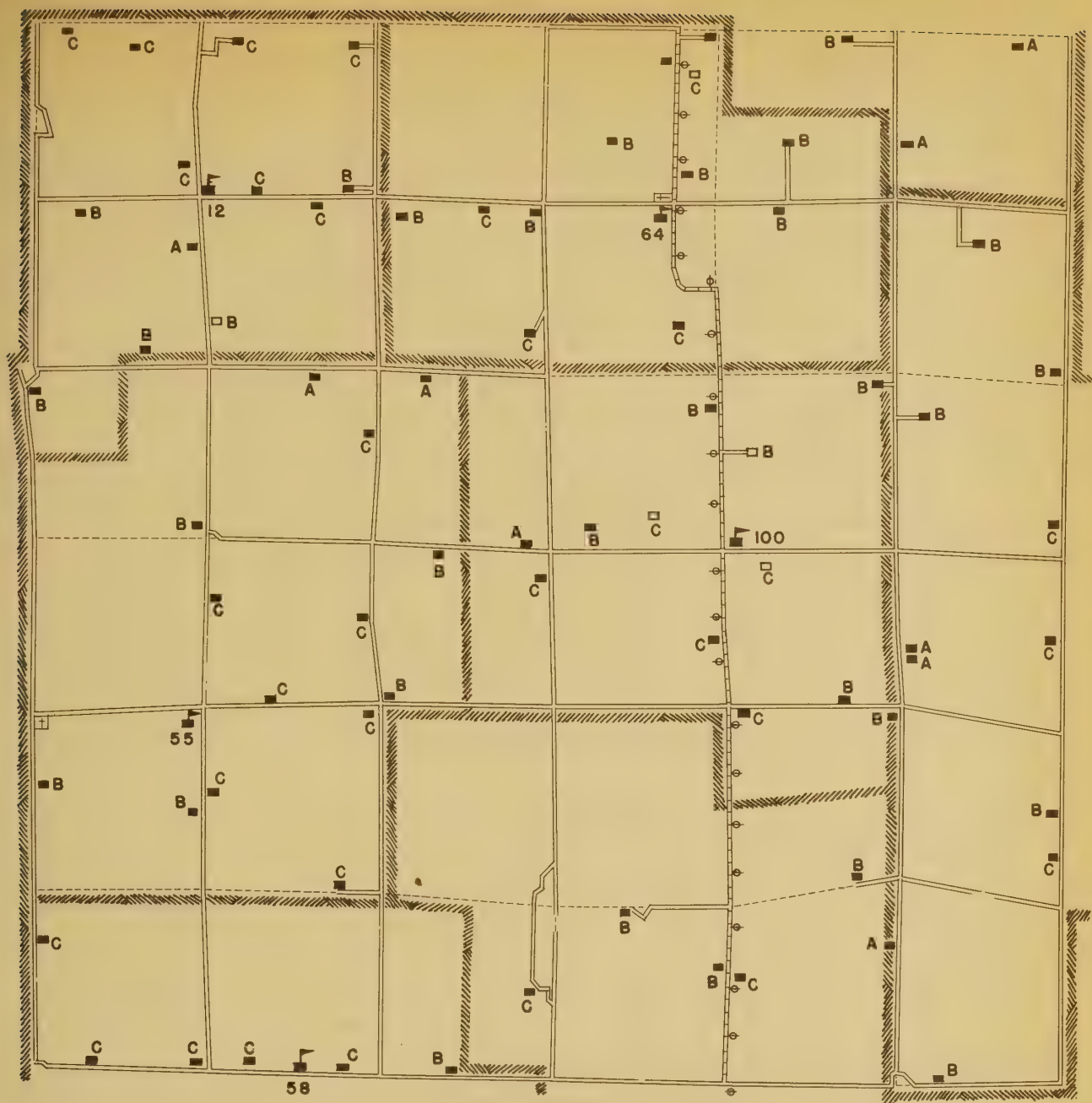
A - A house, barn, and at least one other major building of adequate size and in good state of repair. Other buildings may be in poor condition.

B - A house and barn of adequate size and in fair condition, but in need of minor repairs. Other buildings may be in poor condition.

C.- Farmsteads which are below Class A and B standards.

The location and classification of all farmsteads is shown in Figure 9, and the classification by size groups of those occupied by





## LEGEND

- - - - - CLOSED SECTION LINE  
 = = = = = SECONDARY ROADS  
 = = = = = STATE HIGHWAY NO. 21 (GRAVELED)  
 ⊕ ⊕ POWER LINE  
 / / / / / SCHOOL DISTRICT BOUNDARY  
 ⊕ CEMETERY

■ OCCUPIED FARMSTEAD  
 □ UNOCCUPIED FARMSTEAD  
 10 DISTRICT SCHOOL  
 10 SCHOOL DISTRICT NUMBER

} A - GOOD  
 } B - MEDIUM  
 } C - POOR

SCALE OF MILES

0 1

FIGURE 9. INSTITUTIONAL PATTERN  
 UNION TOWNSHIP (T.3N-R.23W)  
 FURNAS COUNTY, NEBRASKA 1936

PREPARED BY  
 NEBRASKA AGRICULTURAL EXPERIMENT STATION  
 IN COOPERATION WITH  
 LAND USE PLANNING SECTION  
 LAND UTILIZATION DIVISION  
 RESETTLEMENT ADMINISTRATION-REGION VII  
 UNITED STATES DEPARTMENT OF AGRICULTURE







farm operators is shown in Table 29. The proportion of Class A farmsteads increases consistently from the smaller to the larger farms, while the proportion of Class C farmsteads decreases.

Table 29. Relation between the size of farm and the classes of farmsteads occupied by farm operators on 61 farms in Union Township, Furnas County, Nebraska, 1936

Size group (acres)	: Number : of : farmsteads:	Percentage distribution by classes				
		A	B	C	Total	
(1)	(2)	(3)	(4)	(5)	(6)	
279 and under:	26	4	38	58	100	
280 to 439	18	11	56	33	100	
440 and over	17	35	47	18	100	
All farms	61	15	46	39	100	

Nine, or 15 per cent, of the 61 farmsteads are Class A, 28, or 46 per cent, are Class B, and 24, or 39 per cent, are Class C.

There are 14 other farmsteads in the area in addition to the 61 occupied by farm operators. Three of the 14 are occupied Class B farmsteads, six are occupied Class C, two are unoccupied Class B, and three are unoccupied Class C. Former operators and farm laborers live in the nine farmsteads which are occupied.

Including all farmsteads, 44 per cent are Class C, 44 per cent are Class B, and 12 per cent are Class A.



### Modern conveniences

Data showing the proportion of the farm homes having the common modern conveniences are shown in Table 30. In general, the operators on the larger farms have more modern conveniences than those on the smaller farms, and the houses tend to be larger.

Table 30. Relation between the size of farm and the modern conveniences in farm residences on 62 farms in Union Township, Furnas County, Nebraska, 1936

Size group (acres)	No. of farms	Av. no. of rooms per house	Percentage of residences having						
			Tele- phone	Radio	Electric lights	Fur- nace	Run- ning water	Bath	Kitchen pump
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
279 and under	23	5	35	17	4	0	9	0	9
280 to 439	20	6	50	40	10	5	20	10	30
440 and over	19	8	58	68	32	16	16	16	21
All farms	62	6	47	40	10	6	15	8	19

### Models of automobiles

According to Table 31, 91 per cent of the operators have automobiles. Most of them are in the lower price range, and but few of them have been purchased during recent years. Eighty-one per cent of the automobiles were six years old or over in 1936, and 83 per cent of the total are in the low price range. The operators on the larger farms have later and larger models than those on the smaller farms.





Table 31. Relation between the size of farm and the models of automobiles owned by farmers on 64 farms in Union Township, Furnas County, Nebraska, 1936

Size group (acres)	Number of farms	Per cent having autos	Per cent each year's model is of total number of automobiles
(1)	(2)	(3)	(4) : (5) : (6) : (7) : (8) : (9) : (10) : (11) : (12) : (13) : (14) : (15) : (16) : (17) : (18)
279 and under	23	78	- : - : - : 6 : 22 : 6 : 22 : 11 : 33 : - : - : - : - : - : -
280 to 439	22	95	- : - : - : - : 9 : 9 : 23 : 23 : 14 : 4 : - : - : - : - : 9
440 and over	19	100	11 : - : - : - : 5 : 5 : - : 31 : 16 : 5 : 11 : 5 : - : - : 11
All farms	64	91	4 : - : - : 2 : 10 : 7 : 10 : 22 : 24 : 7 : 5 : 2 : - : - : 7



## APPLICATION

The conclusions, interpretations, and recommendations developed in this section are based on the data presented in the preceding sections together with such other information as was available. Because of insufficient information and conflicting opinions, they are necessarily somewhat general.

## Desirable Adjustments in Land Use

Crop vs. non-crop land

Since the number of crops that can be grown in the rotation in this area is rather restricted, particularly perennial grasses and legumes, major uses will be limited largely to the annual cereal and forage crops on the crop land and native perennial grasses on the non-crop land. Adjustments in use will be determined in part by the difficulties involved in establishing satisfactory cropping systems and in returning present unproductive crop land to grass land. Furthermore, as pointed out by Schickele<sup>1/</sup>, conservation policies center around the question as to where the level of natural soil fertility should be stabilized in order to maximize the economic returns from the land over a long period of time. The

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<sup>1/</sup> "Economics of Agricultural Land Use Adjustments: I. Methodology in Soil Conservation and Agricultural Adjustment Research", by Rainer Schickele. Research Bulletin 209, Iowa Agricultural Experiment Station, 1937.



determination of such levels is one of the most difficult, yet most important, problems concerned with land use.

In view of these complexities, it is impossible to definitely indicate what land should or should not be cropped. Based on the physical analyses presented in the preceding section (pages 6 - 29) and adoption of acceptable cultural practices, however, the seven following use conditions should be recognized in Union Township:

1. Holdrege silt loam in crop land. There are 9600 acres of land in this condition, or 43.1 per cent of the entire area. This land is generally well suited to arable farming.

2. Holdrege silt loam in native grass and other non-crop land. The soil in this condition is inherently relatively productive and well suited to cropping, but much of it cannot be economically cropped because of position, size, and shape of the tracts. Three per cent of the area, or 660 acres, are now in this condition. This includes a few isolated tracts which could apparently be used more effectively as crop land.

3. Colby-Nuckolls silt loam in crop land whose use as crop land is questionable. The 1759 acres in this condition, or 7.8 per cent of the area, is in Slope Group C, Erosion Class 2. If proper conservation and erosion control measures are practiced, it is estimated that one-third or more of the land in this condition may be retained more or less definitely in cultivation.





4. Colby-Muckolls silt loam in crop land which should without question be returned to native grass. The land in this condition is mapped as C Slope and Class 3, 4, and 5 erosion. This condition involves 2459 acres, or 11.0 per cent of the area.

5. Colby-Muckolls silt loam in grass land which should remain in grass. There are 6806 acres in this condition, which comprise 30.5 per cent of the area.

6. Hall and Judson silt loams in crop land. There are 529 acres in this condition, which constitute 2.4 per cent of the area. These two soils are the most productive in the area, and where the tracts are sufficiently large and run-off from higher lying land is properly controlled, the most effective use would be as crop land.

7. Hall and Judson silt loams in grass land. Even though the 492 acres, or 2.2, per cent of the land, in this condition are as productive as the land in condition 6, it may be assumed that their use as crop land would be questionable because of the position and size of tract.

A summary of the present land use and the proposed adjustments as outlined in the seven use groups is presented in Table 32. These data indicate that a decrease in the proportion of the crop land from 64.3 per cent to 48.0 per cent would be desirable. This would be a reduction of approximately 25 per cent in the present crop land,



Table 32. Summary of desirable adjustments in land use  
Union Township, Furnas County, Nebraska, 1936

Present use			:	Desirable use		
Acres	:	Per cent	:	Acres	:	Per cent
(1)	:	(2)	:	(3)	:	(4)
Crop land						
14327	:	64.3	:	10708	:	48.0
Native grass and other farm land						
7958	:	35.7	:	11577	:	52.0
Total land						
22285	:	100.0	:	22285	:	100.0

and an increase of 45 per cent in non-crop land, primarily native grass. The conditions which would be affected by these changes are shown in Figure 2.

#### Conservation practices

Sound conservation practices will involve contouring and stripping a large proportion of the crop land for moisture conservation and reduction of wind and water erosion. As much of the Colby-Muckolls silt loam, Erosion Class 2 (condition 3 above), should be retained in cultivation as is feasible.

The fence lines between the crop and grass land should be rebuilt to serve as permanent contours. Since the permanent contours should be so located as to be sound from both agronomic and





engineering standpoints, they will tend to follow, but not hold strictly to, soil and slope lines. To establish such contours, it will be necessary in certain instances to return some of the present Holdrege silt loam crop land to grass. Their exact location should be determined only after a careful study of local conditions.

#### Size and Type of Unit Most Likely to Succeed

The summary of the opinions of 60 farmers pertaining to the minimum sized economic unit is reported in Table 33. These opinions, which are based on present land use, show a well defined modal group

Table 33. Relation between recommended and present size of operating unit of 60 farmers in Union Township, Furnas County, Nebraska, 1936

Size group (acres)	Opinions		Size of unit			
			Recommended		Present	
	Number	Per cent	minimum	Mode	mean	(mean)
(1)	(2)	(3)	(4)	(5)	(6)	(6)
160 and under	5	8	160	160	402	
161 to 280	12	20	240	243	284	
281 to 360	33	55	320	321	362	
361 to 400	4	7	400	400	339	
401 and over	6	10	480	492	421	
All	60	100	320	314	354	

of 281 to 360 acres, with a mode of 320 acres. Thirty-two, or 53 per cent of the 60 farmers, believed that 320 acres



constituted the minimum sized economic unit. These estimates would be increased under the proposed adjusted use.

In certain areas, small specialized farms can be operated on an economic basis. It is doubtful, however, if such units can be operated profitably under conditions found on the uplands of Union Township and surrounding areas. There was one specialized truck farm in Union Township. This particular farmer's financial progress statement indicated that he had not been able to maintain his capital. The summary of all financial progress statements (Table 26) shows that operations on the smaller farms are more likely to be conducted at a loss.

The budget approach was also used in an effort to determine what constitutes a minimum sized economic unit. The limitations of this type of approach are fully recognized, but if carefully used the budget analysis has considerable value. Variability in the personal equation is particularly disturbing. If the budgets are developed, however, on the basis of the average or even somewhat superior individual, it may be assumed that the likelihood of success is even less for the individual below the average in managerial ability.

Summaries from budgets showing estimated income and expenses are reported in Table 34 for three sizes of farms. The budgets



were based on present use of land and desirable use of land. In each instance, they were also based on average land in each size group and on the average land in the township. The former was used

Table 34. Estimated average income and expenses  
on different sized farms in  
Union Township, Furnas County, Nebraska

Size of farm <sup>1/</sup> budgeted (acres)	Present use				Desirable use			
	Gross	Gross	Net income	Per acre	Gross	Gross	Net income	Per acre
	income	expenses	Total		income	expenses	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

Based on average land in size group

240	1759	1083	676	2.82	1541	1113	428	1.78
320	2029	1245	784	2.45	1942	1307	635	1.98
400	2619	1500	1119	2.80	2285	1511	774	1.94

Based on average land in township

240	1603	1085	518	2.16	1451	1115	336	1.40
320	2087	1243	844	2.64	1948	1306	642	2.01
400	2604	1476	1128	2.82	2338	1501	867	2.17

<sup>1/</sup> Since there was some variation in the measured acreages, the average land in each size group and in the township was adjusted to the exact sizes reported in this column. The number of farms in the size groups was 14, 18, and 6, respectively.

in order to conform as nearly as possible to existing farms within each size group, and the latter to eliminate the variability in land between size groups.

Under desirable use all Holdrege silt loam was considered as crop land, Colby-Muckolls silt loams as non-crop land, and Hall-Judson silt loams on the basis of the 1935-1936 use pattern.





The general procedure followed in developing the budgets may be described as follows:

1. The crop rotations used for both present and desirable use were those followed in the area in 1935 and 1936.

2. The yields reported in Table 36 (properly weighted according to land types) were used.

3. The amount and kind of crops remaining for sale was determined by deducting estimated seed and feed requirements from production.

4. Excepting cattle, the kinds and numbers of livestock kept in 1935 and 1936 were used. The numbers of cattle were adjusted to the carrying capacity of the pastures as estimated by land types in Table 36. The feed requirements for the various types of livestock were taken from "Farm Budgets - Analysis and Planning", by L. F. Snipes and Arthur E. Medlar.<sup>1/</sup>

5. Average prices for the period 1895 to 1932 as reported in Nebraska Agricultural Experiment Station Bulletin 284 were used. It was necessary to supply certain prices not reported in this bulletin. In general, the prices used were as favorable as those which prevailed during the period 1910 - 1914.

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<sup>1/</sup> University of Nebraska Agricultural College Extension Service and Rural Economics Department, United States Department of Agriculture, and Nebraska County Farm Bureaus Cooperating, March 1933.



6. Deductions of livestock and livestock products were made for home consumption. In addition, a small acreage was set aside for a farm garden and orchard.

7. Minimum expense charges were entered against such items as taxes, repairs and improvements, feed, livestock, and crop expenses. In addition, interest was charged at the rate of 5 per cent on the assessed valuation of the land and on a reasonable investment in livestock and equipment. Depreciation charges of 4 per cent on buildings and 7.5 per cent on equipment were made.

As indicated in Table 34, the estimated net farm income under present use ranges from \$518 to \$1128 for the different sizes, when adjusted to comparable use and productivity. Similar ranges under desirable use are from \$336 to \$867.

Such net incomes are relatively low when it is considered that all goods and services purchased, including recreational and educational expenses and life insurance and other savings, must be paid from them. Since minimum requirements for such items are variable and cannot be definitely defined, it is impossible to indicate the amount necessary to purchase them. A summary of the Nebraska Home Account records may be used as a guide, however, in estimating such expenditures. An average of 953 records covering the seven years 1929 to 1935 indicates that \$610 per family is required for





goods and services purchased.<sup>1/</sup> This figure does not include the value of goods and services furnished by the farm nor savings including life insurance.

It is to be observed that a change from present to desirable use or a less intensive use involves a reduction of \$182 to \$261 in net income. It is apparent, therefore, that a change to desirable use cannot be justified unless the farms are enlarged to the extent that such decrease will be offset. Such enlargement can doubtless be made without material increase in the overhead and operating costs.

Based on all available information, it would appear that a 320-acre farm, when operated by the owner, is about the minimum which will permit proper conservation practices, provide an adequate living, and maintain or liquidate the investment. One or two instances are known, however, where farms in the area smaller than this have returned sufficient income to purchase the farm in whole or in part. The conditions are even less favorable for the tenant operator when the prevailing rents are charged.

On the basis of 320 acres, 30 operating units in the area, or 39 per cent, may be considered uneconomic. In comparison, 77, or 73 per cent, of the ownership units have less than 320 acres.

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<sup>1/</sup> "Summary of Nebraska Home Account Records, 1929-1936", Smith, Iuriel, Nebraska Extension Service, Circular 11-114.



An examination of the operating and ownership unit patterns in Figures 4 and 5 will show that such units, especially the latter, are rather widely scattered.

In addition to distribution of the units, owner-tenant relations, the personal equation, credit, proper appreciation of the physical resources, and many other factors contribute to the difficulties involved in developing economic units. The solution in most instances extends beyond the field of farm management and will require more than individual action.

#### Rural Land Appraisal and Productivity

Assessment for taxation and other appraisals should be based on sound land evaluation, the same as proper and effective land use. Inequalities in such appraisals may encourage or lead to improper land use.

In order to analyze the possible relationships, assessed valuations, Agricultural Conservation Association appraisals, and mortgage values were compared with the productivity ratings reported in Table 36. The appraisals for the various tracts of land were compared in each instance with a productivity rating for the same tract properly weighted according to the land types involved.

#### Assessment for taxation

One of the weaknesses in the administration of the property tax is the inequalities which frequently occur in assessed valuation.



It is an accepted fact that property should be valued for taxation purposes in accordance with its power to produce. Lutz states:

"It is impossible to assess either rural or urban land fairly and accurately without more complete data relating to the quality, in the case of farm land, the yield....than are now collected by the ordinary state in preparation for the periodic assessment of its lands."<sup>1/</sup>

The 150 assessed tracts of land in Union Township are shown in Figure 10. These tracts are numbered in order of decreasing productivity as based on present use. It is to be observed that the two tracts of unassessed state school land are not numbered.

The bar chart, Figure 11, shows the relation between the 1936 assessed valuations of the land and the present use productivity expressed in food units. Both the assessed valuation and productivity are expressed in a per cent of the average and the arrangement is on the basis of decreasing productivity. A similar chart based on desirable use productivity is shown in Figure 12. Desirable use interpretations were as follows: (1) all Holdrege silt loam was considered as crop land, (2) all Colby-Nuckolls silt loams were considered as non-crop land (pasture), and (3) the Hall-Judson silt loams were rated on the basis of the present use pattern.

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<sup>1/</sup> Public Finance, Lutz, H. L., p. 362, D. Appleton and Co., 1925







FIGURE II. ESTIMATED ACRE PRODUCTIVITY UNDER PRESENT USE (100 PER CENT = 12.9 FEED UNITS) AND ASSESSED VALUATION (100 PER CENT = 16.30 PER ACRE) OF THE 150 ASSESSED TRACTS IN UNION TOWNSHIP (T. 3N.-R. 23W.) FURNAS COUNTY, NEBRASKA, 1936  
(THE TRACTS ARE ARRANGED AND NUMBERED IN ORDER OF DECREASING PRODUCTIVITY—SEE FIGURE IO FOR THEIR LOCATION)

PREPARED BY  
NEBRASKA AGRICULTURAL EXPERIMENT STATION  
LAND USE PLANNING SECTION—LAND UTILIZATION DIVISION  
RESETTLEMENT ADMINISTRATION—REGION VII  
UNITED STATES DEPARTMENT OF AGRICULTURE





FIGURE 12. ESTIMATED ACRE PRODUCTIVITY UNDER DESIRABLE USE (100 PER CENT=11.5 FEED UNITS) AND ASSESSED VALUATION (100 PER CENT=\$16.30 PER ACRE) OF THE 150 ASSESSED TRACTS IN UNION TOWNSHIP T.3N.-R.23W. FURNAS COUNTY, NEBRASKA, 1936  
(THE TRACTS ARE ARRANGED IN ORDER OF DECREASING PRODUCTIVITY)

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UNITED STATES DEPARTMENT OF AGRICULTURE





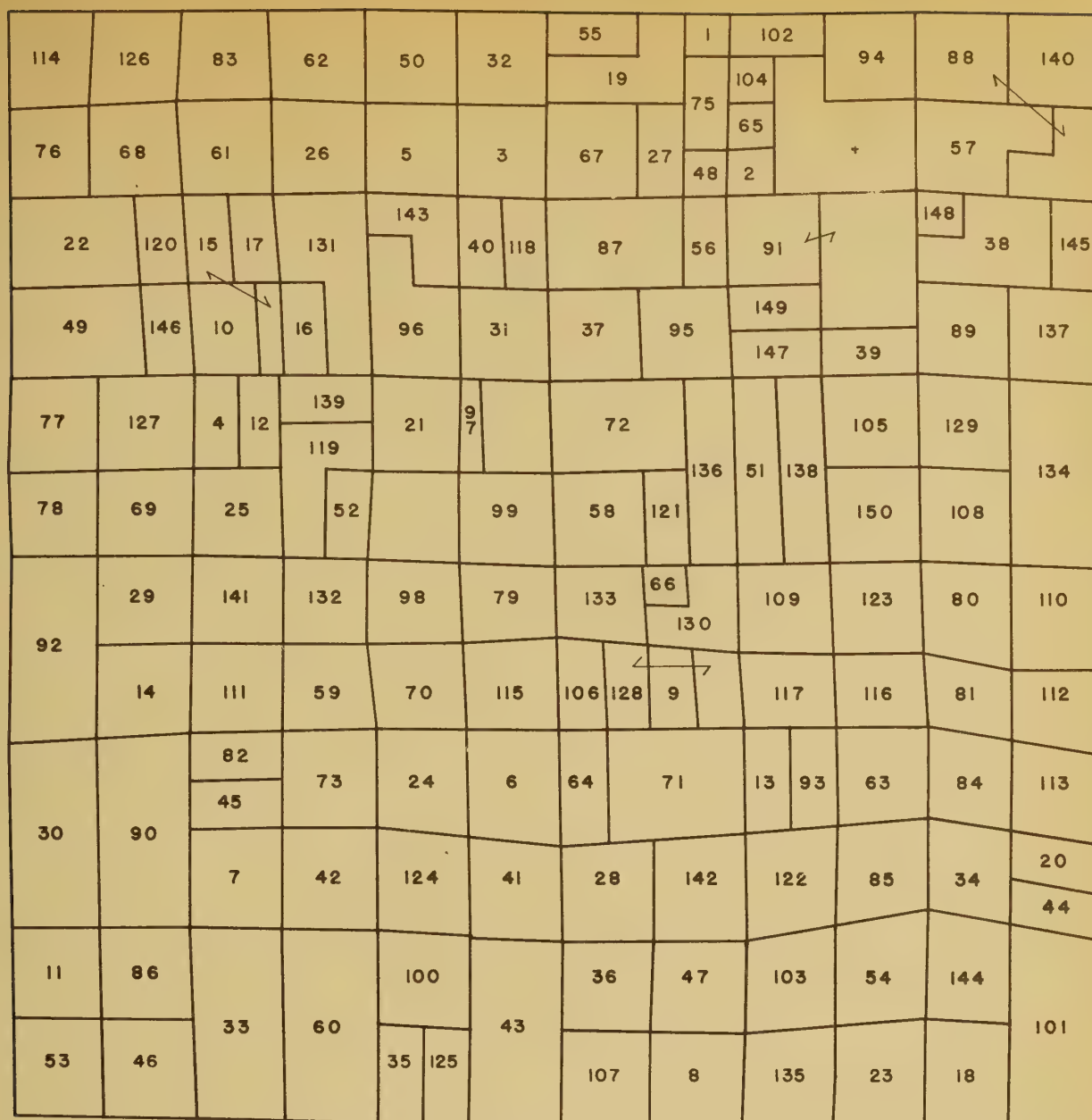


FIGURE 10. ASSESSMENT UNIT PATTERN  
UNION TOWNSHIP (T.3N.-R.23W.)  
FURNAS COUNTY, NEBRASKA 1936

THE TRACTS ARE NUMBERED IN ORDER OF ESTIMATED DECREASING ACRE  
PRODUCTIVITY WHICH IS THE SAME ARRANGEMENT SHOWN IN FIGURE 11.



PREPARED BY  
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LAND USE PLANNING SECTION  
LAND UTILIZATION DIVISION  
RESETTLEMENT ADMINISTRATION-REGION VII  
UNITED STATES DEPARTMENT OF AGRICULTURE



1871

1872

1873

1874

1875

1876

1877

1878

1879

The data in Figures 11 and 12 are shown in Figure 13 in the form of a scatter diagram.

The productivity ratings were weighted in each instance according to the acreages involved, but no consideration was given to the size, shape, or position of tracts. These factors would doubtless be given consideration in assessment appraisals.

The relationships may also be expressed effectively statistically by means of the correlation analyses. If changes between assessed and productivity values always occur in the same degree, the relationship is perfect and a correlation of one is obtained. In contrast, a zero correlation results if no relationship exists. The correlation analyses may also be used to show the extent to which variability in one set of measurements is associated with the other set of measurements and to contrast the rate of change in their respective units of measurement.

Although the correlations of .432 and .304 between assessed valuations and productivity under present and desirable use are highly significant statistically, the association is very poor. Based on these correlations, only 19 and 9 per cent of the variability in the assessed valuations may be associated with present and desirable use productivity. Or, stated conversely, 81 and 91 per cent of the variability in the assessed valuations is unrelated to the



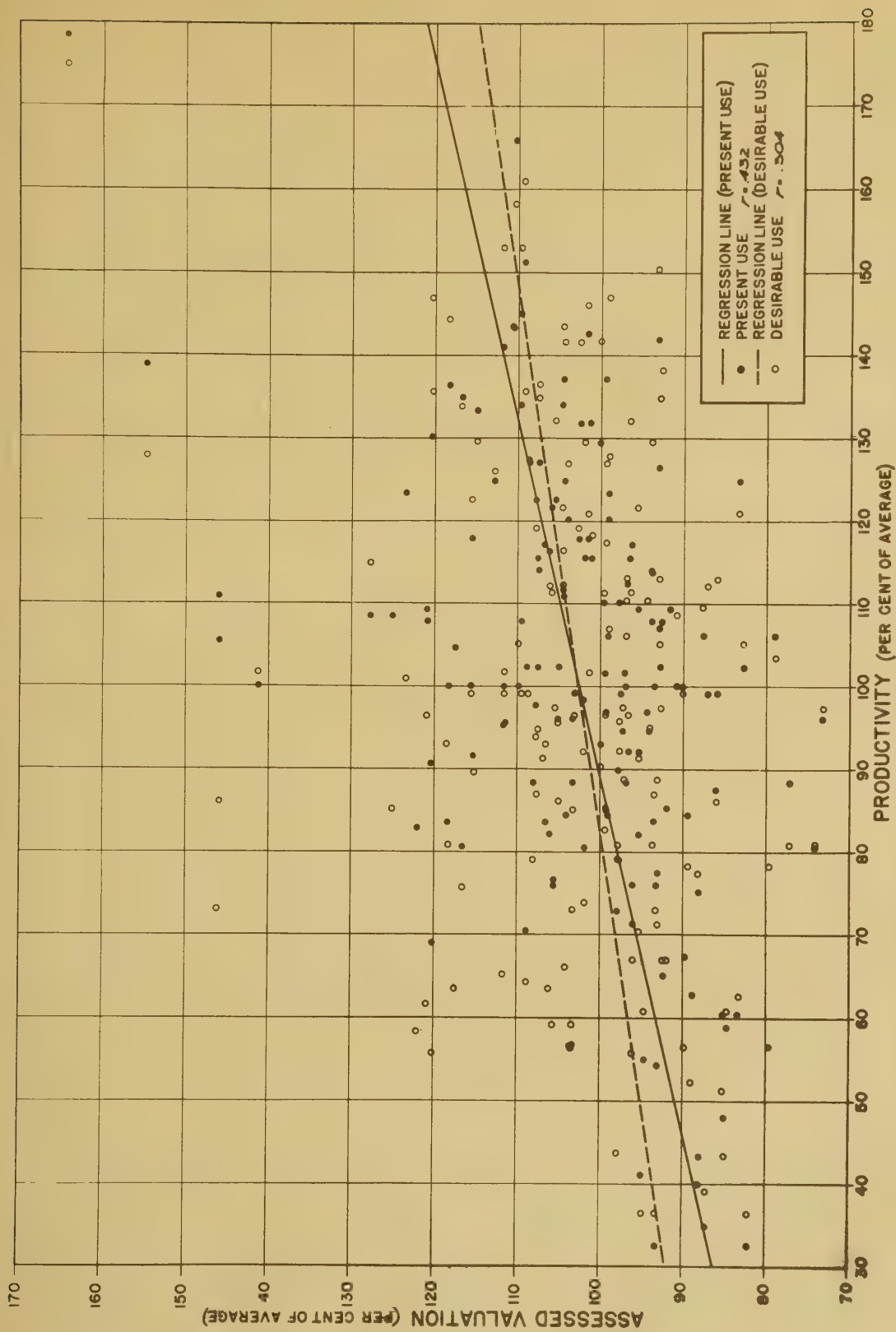


FIGURE 13. SCATTER DIAGRAM OF RELATION BETWEEN THE ESTIMATED ACRE PRODUCTIVITY AND ASSESSED VALUATION OF THE 150 ASSESSMENT TRACTS IN UNION TOWNSHIP FURNAS COUNTY, NEBRASKA 1936

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estimated productivity. For each food unit change in estimated productivity, there was a change of 29 and 21 cents per acre, respectively, in assessed valuations.

These relationships may be observed graphically in Figures 11 to 13. Compared to productivity, assessments are less variable, but there are frequent instances of extreme over-assessment and under-assessment. The scatter about the regression lines further illustrates the lack of association.

#### Agricultural Conservation Association Appraisals

Corn or crop land productivity appraisals as established in 1936 by the Furnas County Agricultural Conservation Association for 93 tracts of land in Union Township were correlated with the productivity ratings based on land types for the crop land under the 1935-1936 use pattern.

The correlation for the 93 comparisons was .587. This indicates that 34 per cent of the variability in the Agricultural Conservation Association appraisals is associated with productivity as determined on the basis of land types. For each unit change in feed units in the latter, there was a change of .49 bushels in the former.

The average productivity of all the crop land as expressed in corn yields by the agricultural conservation appraisals was 17.5 bushels per acre. The average productivity based on land types under

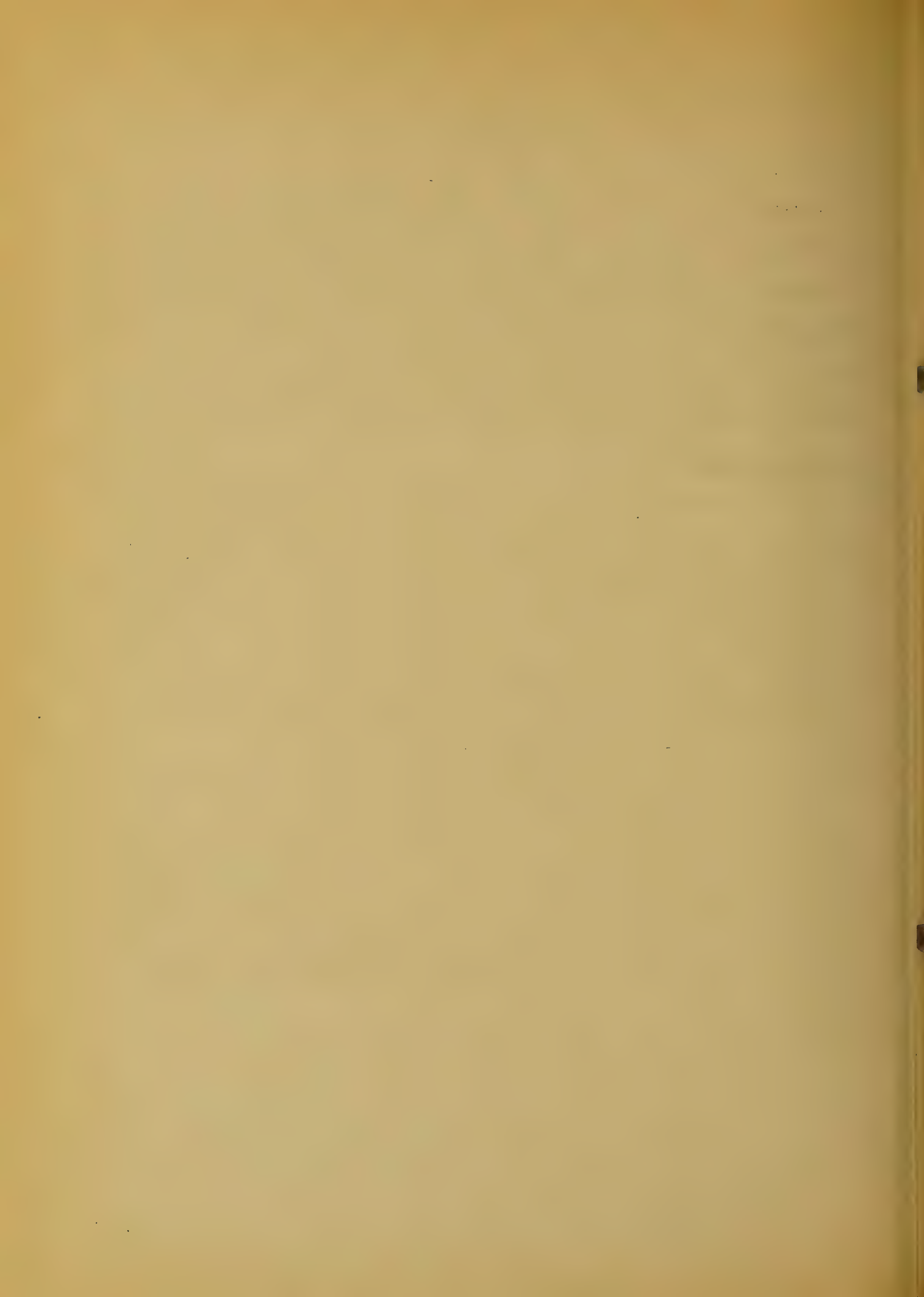


the 1935-1936 use pattern was also 17.5 feed units per acre. The variability in the Agricultural Conservation appraisals was much less, and only approximately one-third of it was associated with the ratings based on land types. Compared to the productivity ratings, the poor land has been overvalued and the good land undervalued in the Agricultural Conservation Association appraisals.

#### Mortgaged valuations

The average acre values of the first mortgages for the 39 tracts of land reported in Table 20 were correlated with the productivity ratings based on land types under the 1935-1936 use pattern. Conclusions based on this comparison are necessarily limited, since it was not possible to eliminate the variability due to the values placed on buildings or to determine the relation between the mortgaged and the respective appraised values.

The correlation between the average mortgaged value per acre and productivity was .192. This low and relatively insignificant correlation indicates that only 4 per cent of the mortgaged value is associated with productivity. For each unit change in estimated feed unit production, there was a change of 40 cents per acre in mortgaged value.





Relation of Size and Type of Unit, Tenure,  
Institutional Pattern, and Other Factors  
to Effective Conservation Practices and Land Use.

Ideally it would be desirable to reconstruct the present land-use pattern with (1) crop lines following soil and slope lines rather closely, (2) each unit containing at least the minimum number of acres and a proper balance between arable and non-arable land, and (3) community and institutional patterns so developed as to permit the most effective use of land.

Such adjustments cannot be fully attained. If a permanent and stable agriculture is to be developed in the area, however, it appears that many rather drastic changes should be made. The more important would include:

1. Returning a considerable portion of the present crop land to permanent grass. This may ultimately involve 25 per cent or more of the present crop base.

2. Introduction of effective conservation practices such as contouring and stripping the crop land, contour furrowing the grass land, and controlling gully erosion in order to increase yields and minimize soil losses and flood hazards.

3. Assessment of farm land and other appraisals to be made on the basis of productivity.

4. Equitable distribution of tax moneys, particularly those derived from public utilities.



5. Carrying over increased feed reserves from favorable to unfavorable years in order to stabilize livestock production and thus the entire farm economy.

6. The building up of the smaller farms into economic units. Although there may be enough land in the area if redistributed to provide economic units for the present number of operators, it would appear that a combination of the smaller farms where possible, or their addition to larger farms, would be more desirable. Such adjustments would mean a reduction in the number of operating units and a relocation of certain farmers.

Such changes will start slowly, but they will develop more rapidly with education and experience. It is essential that proper land use and operation be defined as closely as possible in order that practices not meeting the prescribed standards may be discouraged. Certain adjustments such as contour farming will be adopted rather readily. In other instances, further research and demonstration will be necessary, such as in methods of regrassing land to be retired from cultivation. In still other instances, it may be necessary to provide credit or other facilities for maintaining or developing economic units. If it is necessary to reduce the number of farms, provision must be made for relocating or finding employment for the farmers released. Finally, through education, zoning, or other directional measures, every effort must be made to maintain all gains.



## APPENDIX

Tables 35 to 43





Table 35. Use, soil, slope, and erosion classification of all land in  
Union Township (T 3N, R 23W) Furnas County, Nebraska, 1936

Soil types, slope groups, and erosion classes <sup>1/</sup>																				
Item	Holdrege silt loam						Hall silt loam		Judson silt loam		Colby silt loam and Nuckolls silt loam									
	A		B		Total	Total	B	Total	B	Total	C					Total				
	1	2	1	2							3	1	2	1	1-6		2	3	4	5
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Crop land																				
Acres	: 32.5:		: 9550.4:	17.0:	9599.9:		: 124.8:	124.8:		: 403.9:	403.9:			: 1739.3:	2178.4:	277.5:	3.5:	4198.7:	14327.3	
Percentages based on:																				
Crop land in soil type	: 0.34:		: 99.48:	0.18:	100.0:		: 100.0:	100.0:		: 100.0:	100.0:			: 41.43:	51.88:	6.61:	0.08:	100.0:		
Total land in soil type	: 0.32:		: 93.08:	0.16:	93.56:		: 34.11:	34.11:		: 61.72:	61.72:			: 15.81:	19.79:	2.52:	0.03:	38.15:		
Total crop land	: 0.23:		: 66.66:	0.12:	67.01:		: 0.87:	0.87:		: 2.82:	2.82:			: 12.14:	15.20:	1.94:	0.02:	29.30:	100.0	
Total farm land	: 0.15:		: 42.85:	0.08:	43.08:		: 0.56:	0.56:		: 1.81:	1.81:			: 7.81:	9.77:	1.24:	0.02:	18.84:	64.29	
Native grass land <sup>2/</sup>																				
Acres	: 526.5:		: 526.5:	215.6:	2.0:	217.6:	215.0:		: 215.0:	355.3:	5935.9:	7.0:	35.0:			: 6333.2:	7292.3			
Percentages based on:																				
Grass land in soil type	: 100.0:		: 100.0:	99.08:	0.92:	100.0:	100.0:		: 100.0:	5.61:	93.73:	0.11:	0.55:			: 100.0:				
Total land in soil type	: 5.13:		: 5.13:	58.92:	0.55:	59.47:	32.86:		: 32.86:	3.23:	53.94:	0.06:	0.32:			: 57.55:				
Total grass land	: 7.22:		: 7.22:	2.95:	0.03:	2.98:	2.95:		: 2.95:	4.87:	81.40:	0.10:	0.48:			: 86.85:	100.0			
Total farm land	: 2.36:		: 2.36:	0.97:	0.01:	0.98:	0.96:		: 0.96:	1.59:	26.64:	0.03:	0.16:			: 28.42:	32.72			
Other farm land <sup>3/</sup>																				
Acres	: 5.0:	: 109.0:	20.0:		: 134.0:	23.5:		: 23.5:	27.5:	8.0:	35.5:	86.6:	7.5:	136.6:	196.6:	44.5:	1.0:	472.8:	665.8	
Percentages based on:																				
Other land in soil type	: 3.73:	: 81.34:	14.93:		: 100.0:	100.0:		: 100.0:	77.46:	22.54:	100.0:	18.32:	1.59:	28.89:	41.58:	9.41:	0.21:	100.0:		
Total land in soil type	: 0.05:	: 1.06:	0.20:		: 1.31:	6.42:		: 6.42:	4.20:	1.22:	5.42:	0.79:	0.07:	1.24:	1.79:	0.40:	0.01:	4.30:		
Total other land	: 0.75:	: 16.37:	3.01:		: 20.13:	3.53:		: 3.53:	4.13:	1.20:	5.33:	13.01:	1.12:	20.52:	29.53:	6.68:	0.15:	71.01:	100.0	
Total farm land	: 0.02:	: 0.49:	0.08:		: 0.60:	0.10:		: 0.10:	0.13:	0.04:	0.17:	0.39:	0.03:	0.61:	0.88:	0.20:	0.01:	2.12:	2.99	
All farm land																				
Acres	: 5.0:	32.5:	635.5:	9570.4:	17.0:	10260.4:	239.1:	126.8:	365.9:	242.5:	411.9:	654.4:	441.9:	5943.4:	1882.9:	2410.0:	322.0:	4.5:	11004.7:	22285.4
Percentages based on:																				
Total land in soil type	: 0.05:	0.32:	6.19:	93.28:	0.16:	100.0:	65.34:	34.66:	100.0:	37.06:	62.94:	100.0:	4.02:	54.01:	17.11:	21.90:	2.92:	0.04:	100.0:	
Total farm land	: 0.02:	0.15:	2.85:	42.94:	0.08:	46.04:	1.07:	0.57:	1.64:	1.09:	1.85:	2.94:	1.98:	26.67:	8.45:	10.81:	1.44:	0.03:	49.38:	100.0

<sup>1/</sup> See pages 6 - 17 and Figure 2 for description of soil types, slope groups, and erosion classes

<sup>2/</sup> As mapped, the native grass land consists of 92.1 per cent permanent pasture and 7.9 per cent native hay

<sup>3/</sup> Other farm land includes the following uses in the indicated proportion: waste land 54.4 per cent, farmsteads 21.5 per cent, scattered forest 10.0 per cent, abandoned crop land, largely revegetated 8.6 per cent, abandoned crop land, largely weeds 3.6 per cent, and schools and cemeteries, 1.9 per cent.





Table 36. Use and physical classification and estimated productivity of the soils in Furnas County

Item <sup>1/</sup>	Soil types, slope groups, and erosion classes																								
	Lamoure:	Lamoure:	Cass:	Sar-:	Sar-:	Sar-:	Ter-:	Bdgpt:	But-:	Holdrege silt loam					Colby and Nuckolls silt loams					Rough:					
	Sl-Cass:	Lamoure:	Cass:	py :	py :	py :	race:	2/Bdgpt:	ler :	A		B		Total :	C					stony:	Total				
	vfsl :	scl :	fsl :	vfsl:	fsl :	ls :	soils:	fsl :	scl :	1 :	2 :	1 :	2 :	3 :	Total :	1 :	1-6 :	2 :	3 :	4 :	5 :	Total :	land :		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	
Corn																									
2 Bushels	29.8:	26.8:	29.8:	22.4:	20.9:	17.9:	26.8:	26.8:	14.9:	22.4:	20.9:	17.9:	20.9:		16.4:	11.9:	7.4:	4.5:	13.5:		20.6				
3 Per cent	100:	90:	100:	75:	70:	60:	90:	90:	50:	75:	70:	60:	70:		55:	40:	25:	15:	45.2:		69.1				
3 Total acres	5027:	472:	326:	1464:	1773:	537:	27801:	329:	110:	245:	81304:	163:	81712:		14467:	18137:	2306:	35:	34945:		154496				
Wheat																									
4 Feed Units	18.3:	17.4:	14.7:	12.9:	11.9:	9.1:	16.4:	14.7:	9.1:	13.8:	12.9:	10.7:	12.9:		9.6:	6.6:	3.7:	1.8:	7.6:		12.4				
5 Bushels	16.5:	15.7:	13.2:	11.6:	10.7:	8.2:	14.8:	13.2:	8.2:	12.4:	11.6:	9.6:	11.6:		8.6:	5.9:	3.3:	1.6:	6.8:		11.2				
6 Per cent	100:	95:	80:	70:	65:	50:	90:	80:	50:	75:	70:	58:	70:		52:	36:	20:	10:	41.5:		67.8				
7 Total acres	243:	23:	16:	71:	86:	26:	10357:	123:	41:	90:	29975:	60:	30125:		4796:	6012:	764:	12:	11584:		52695				
Oats																									
8 Feed Units	19.6:	16.7:	14.7:	13.7:	11.8:	7.9:	17.6:	14.7:	9.8:	14.7:	13.7:	10.6:	13.7:		9.6:	6.5:	3.3:	1.4:	7.6:		13.1				
9 Bushels	38.7:	32.9:	29.0:	27.1:	23.2:	15.5:	34.8:	29.0:	19.4:	29.0:	27.1:	20.9:	27.1:		19.0:	12.8:	6.6:	2.7:	14.9:		25.8				
10 Per cent	100:	85:	75:	70:	60:	40:	90:	75:	50:	75:	70:	54:	70:		49:	33:	17:	7:	38.5:		66.7				
11 Total acres	405:	38:	26:	118:	143:	43:	1636:	19:	6:	18:	5994:	12:	6024:		1045:	1309:	166:	3:	2523:		10981				
Barley																									
12 Feed Units	26.7:	22.7:	20.0:	18.7:	16.0:	10.8:	24.0:	20.0:	13.4:	20.0:	18.7:	14.4:	18.7:		13.1:	8.8:	4.5:	1.8:	10.3:		17.9				
13 Bushels	31.9:	27.1:	23.9:	22.3:	19.1:	12.8:	28.7:	23.9:	16.0:	23.9:	22.3:	17.2:	22.3:		15.6:	10.5:	5.4:	2.2:	12.3:		21.4				
14 Per cent	100:	85:	75:	70:	60:	40:	90:	75:	50:	75:	70:	54:	70:		49:	33:	17:	7:	38.5:		67.1				
15 Total acres	243:	23:	15:	71:	86:	26:	2181:	26:	8:	18:	6071:	10:	6099:		1082:	1356:	172:	3:	2613:		11391				
Sorghum (fodder)																									
16 Feed Units	40.9:	36.9:	40.9:	30.8:	28.6:	24.5:	36.9:	36.9:	20.5:	30.8:	28.6:	24.5:	28.6:		22.5:	16.4:	10.2:	6.1:	18.4:		26.9				
17 Tons	2.82:	2.54:	2.82:	2.12:	1.97:	1.69:	2.54:	2.54:	1.41:	2.12:	1.97:	1.69:	1.97:		1.55:	1.13:	0.70:	0.42:	1.27:		1.85				
18 Per cent	100:	90:	100:	75:	70:	60:	90:	90:	50:	75:	70:	60:	70:		55:	40:	25:	15:	45.2:		65.5				
19 Total acres	487:	45:	31:	142:	172:	52:	2180:	26:	9:	31:	10267:	22:	10320:		2475:	3103:	395:	5:	5978:		19442				

(continued on next page)





Table 36. Use and physical classification and estimated productivity of the soils in Furnas County (continued)

Soil types, slope groups, and erosion classes																								
Item <sup>1/</sup>	Lamoure:	Lamoure:	Cass:	Sar-:	Sar-:	Sar-:	Ter-:	2/Bdgpt:	But-:	Holdrege silt loam						Colby and Muckolls silt loams						Rough:		
	Sl-Cass:	sl	fsl	ry	py	py	race	2/Bdgpt:	ler	A		B		C		Total		Total		Total		stony:	Total	
	vfsl			vfsl	fsl	ls	soils	fsl	sl	1	2	1	2	3	Total	1	1-6	2	3	4	5	Total	land	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
Alfalfa																								
20 Feed Units	47.7:	47.7:	43.0:	38.2:	33.5:	28.6:	45.3:	40.6:	12.0:	21.5:	19.1:	14.4:	19.1:			14.4:	9.5:	5.8:		11.2:			39.1	
Tons	2.55:	2.55:	2.30:	2.04:	1.79:	1.53:	2.42:	2.17:	0.64:	1.15:	1.02:	0.77:	1.02:			0.77:	0.51:	0.31:		0.60:			2.09	
Per cent	100:	100:	90:	80:	70:	60:	95:	85:	25:	45:	40:	30:	40:			30:	20:	12:		23.6:			82.0	
23 Total acres	568:	53:	37:	165:	200:	61:	7087:	84:	28:	4:	1424:	3:	1431:			272:	342:	44:		658:			10372	
All other crop land																								
24 Feed Units	30.9:	28.1:	29.9:	23.3:	21.4:	18.1:	27.3:	26.0:	13.4:	20.4:	19.3:	16.3:	19.3:			15.2:	10.9:	6.6:	3.8:	12.4:			19.7	
25 Per cent	100:	91:	96:	75:	69:	58:	91:	86:	47:	75:	70:	59:	70:			54:	38:	23:	13:	43.6:			68.9	
26 Per cent	100:	91:	97:	75:	69:	59:	89:	84:	43:	66:	62:	53:	62:			49:	35:	21:	12:	40.1:			64.0	
27 Total acres	1135:	107:	74:	331:	400:	121:	3271:	38:	13:	45:	14837:	31:	14913:			2942:	3688:	469:	8:	7107:			27510	
All other farm land																								
28 Feed Units	8.2:	8.2:	6.2:	7.4:	5.7:	4.1:	7.0:	6.2:	6.2:	6.6:	6.2:	5.7:	6.2:	5.7:	4.1:	3.3:	2.5:	1.6:	0.8:	4.1:	0.8:		4.9	
29 Carrying Cap.:	3.7:	3.7:	4.8:	4.1:	5.3:	7.3:	4.3:	4.8:	4.8:	4.5:	4.8:	5.3:	4.8:	5.3:	7.3:	9.1:	12.0:	18.8:	37.5:	7.3:	37.5:		6.1	
30 Per cent	100:	100:	75:	90:	70:	50:	85:	75:	75:	80:	75:	70:	75:	70:	50:	40:	30:	20:	10:	50.2:	10:		59.8	
31 Total acres	11668:	1095:	755:	3398:	4116:	1246:	10383:	123:	41:	134:	16100:	502:	16736:	7896:	106045:	2599:	4130:	790:	12:	121472:	320:	171353		
All land																								
32 Feed Units	17.5:	16.4:	15.9:	13.9:	12.2:	9.8:	24.0:	22.8:	12.2:	6.6:	20.4:	6.2:	19.2:	16.3:	18.0:	5.7:	4.1:	14.2:	10.0:	5.8:	3.3:	7.0:	0.8:	14.2
33 Per cent	100:	96:	84:	84:	70:	53:	90:	84:	53:	80:	75:	75:	70:	59:	70:	70:	50:	52:	37:	23:	13:	47.9:	10:	65.5
34 Per cent	73:	68:	66:	58:	51:	41:	100:	95:	51:	27:	85:	26:	80:	68:	75:	24:	17:	59:	42:	24:	14:	29.2:	3:	59.2
35 Total acres	19776:	1856:	1280:	5760:	6276:	2112:	64896:	768:	256:	134:	451:	16100:	150374:	301:	167360:	7896:	106045:	29678:	38077:	5106:	78:	186880:	320:	458240

<sup>1/</sup> Productivity is expressed in bushels, tons, feed units, and carrying capacity per acre, and relatively. A feed unit is considered equivalent to one bushel of corn, 0.9 bushel of wheat, 1.972 bushels of oats, 1.195 bushels of barley, .069 ton of sorghum fodder, .053 ton of alfalfa hay, and 6 days' pasture for a mature animal. Carrying capacity is expressed in acres required to supply six months of pasture for one animal. The percentages in lines 2, 6, 10, 14, 18, 22, and 30 are based on 100 per cent for those soils which are considered most productive. Those in lines 25 and 33 are weighted averages for all preceding relative use evaluations. Those in lines 26 and 34 are based on the soils having the highest estimated feed unit production. All percentages in Column 25 are based on values in that column.

<sup>2/</sup> The soils on the terraces include Hall, Bridgeport, and Judson silt loams and Hall and Bridgeport very fine sandy loams



Table 37. Relation between the size of farm and the utilization of land  
on 72 farms in Union Township, Furnas County, Nebraska

Item : farms:	Acres in :		Per cent of farm in :		Per cent of crop land in									
	Farm:	Crops:	Native:	Other:	Corn:	Wheat:	Oats:	Sor-	Other deplet-	Conserving				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1935	13	142:	85	60	36	-	4 : 73	2	3	12	9	1		
1936	13	142:	87	61	35	1	3 : 61	11	6	3	3	8		
Average:		142:	86	60	35	1	4 : 67	7	5	1	10	5		
200 to 279 acres														
1935	13	235:	147	62	31	1	6 : 49	24	2	1	12	7		
1936	13	235:	151	64	31	1	4 : 52	26	2	3	6	2		
Average:		235:	149	63	31	1	5 : 50	25	2	2	9	5		
280 to 359 acres														
1935	16	318:	201	63	33	1	3 : 64	9	4	1	10	11		
1936	16	318:	199	62	31	3	4 : 54	25	2	3	6	2		
Average:		318:	200	63	32	2	3 : 59	17	3	2	8	7		
360 to 439 acres														
1935	7	395:	240	61	32	3	4 : 58	19	3	2	12	5		
1936	7	395:	237	60	34	3	3 : 59	20	3	-	5	7		
Average:		395:	238	60	33	3	4 : 59	19	3	1	8	6		
440 to 519 acres														
1935	10	475:	324	68	25	3	4 : 51	24	3	4	8	7		
1936	10	475:	327	69	25	2	4 : 47	32	1	5	3	2		
Average:		475:	325	68	25	3	4 : 49	28	2	5	6	4		
520 acres and over														
1935	13	691:	392	57	38	2	3 : 58	13	4	7	8	7		
1936	13	691:	386	56	39	2	3 : 46	26	7	4	5	2		
Average:		691:	389	56	39	2	3 : 52	20	5	6	7	4		
All farms														
1935	72	368:	225	61	33	2	4 : 57	15	3	4	10	8		
1936	72	368:	225	61	33	2	4 : 51	25	4	3	5	3		
Average:		368:	225	61	33	2	4 : 54	20	4	4	7	5		

1/Includes rye, small grain for pasture, idle crop land, sudan hay, millet, potatoes and other vegetables  
2/Includes alfalfa, sweet clover, other legume hay, sudan pasture, rotation pasture, and fallow  
- Less than one-half of one per cent











Table 39. The relation between size of farm and 1935, 1936, normal, and recommended acreages of important crops on 47 farms in Union Township, Furnas County, Nebraska<sup>1</sup>

Item	No. of farms	Number of acres usually operated	Corn Av. acreage	Wheat Av. acreage	Oats Av. acreage	Barley Av. acreage				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
199 acres and under										
1935	5	144	81	150	4	31	0		0	
1936			56	104	21	162	5	125	2	29
Normal			54	100	13	100	4	100	7	100
Recommended:			37	69	34	262	6	150	5	71
200 to 279 acres										
1935	11	233	77	81	8	50	4	133	1	20
1936			75	79	22	138	5	167	4	80
Normal			95	100	16	100	3	100	5	100
Recommended:			69	73	37	231	6	200	7	140
280 to 359 acres										
1935	10	321	144	105	25	37	12	150	12	75
1936			113	82	78	115	6	75	13	81
Normal			137	100	68	100	8	100	16	100
Recommended:			130	95	82	121	10	125	18	112
360 to 439 acres										
1935	7	394	114	69	41	100	12	1200	5	500
1936			130	79	52	127	5	500	0	
Normal			165	100	41	100	1	100	1	100
Recommended:			126	76	84	205	1	100	1	100
440 to 519 acres										
1935	7	478	166	99	39	52	5	45	18	86
1936			127	76	95	127	6	55	21	100
Normal			168	100	75	100	11	100	21	100
Recommended:			127	76	109	145	9	82	19	90
520 acres and over										
1935	7	679	257	123	68	73	19	56	24	185
1936			202	97	93	100	35	103	11	85
Normal			209	100	93	100	34	100	13	100
Recommended:			201	96	105	113	34	100	13	100
47 farms										
1935	47	369	137	99	30	59	9	90	10	100
1936			116	84	60	118	10	100	9	90
Normal			138	100	51	100	10	100	10	100
Recommended:			116	84	74	145	11	110	11	110

<sup>1</sup>Because of length of tenure, normal estimates were not obtained for all farms, and such estimates in a number of instances were not for the identical acreages operated at the present time. The recommendations are limited to those supplying normal estimates.



Table 40. The relation between size of farm and the kind and number of livestock in 1935, 1936, and two-year average on 66 farms in Union Township, Furnas County, Nebraska

Size group (acres)	Number of farms	Acres		Horses			Cattle					Hogs				Chickens		Animal units				
		Farm	Crops	Pas- ture	Work- stock	Colts	Other horses	Cows: for milk	Cows: for beef	Calves	Yearlings	Hei- fers	Steers	2-yr.- olds	All other cattle	Sows and gilts	Spring pigs		Fall pigs	Other hogs	hens	Springs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	
July 1, 1935																						
199 and under	11	140	84	50	3			3	1	3	1					3			54	80	11.8	
200 to 279	14	235	146	75	3			3	1	3	1	1			1	3	3		65	130	14.6	
280 to 359	16	318	200	106	5			5	2	5	1	1	1		1	1	2		62	116	19.1	
360 to 439	6	392	240	120	6		1	6	1	4	2	1	1	1	2	3	3		87	129	22.5	
440 to 519	8	474	306	135	5	1	1	3	5	7	2	3	2	1	1	8	4		90	152	27.3	
520 and over	11	699	397	269	6	1		6	19	18	7	4	1	1	4	25	4		101	184	57.9	
All farms	66	360	218	122	5			4	4	7	2	2	1		1	7	2		73	130	24.7	
July 1, 1936																						
199 and under	11	140	85	48	3			3	1	3	1				1	6			52	105	12.7	
200 to 279	14	235	152	73	4			4	1	4	2	1			1	6		3	53	118	16.5	
280 to 359	16	318	197	101	4			5	2	5	2	1			1	6			49	87	19.5	
360 to 439	6	392	237	128	5			7		4	1		1	1	1	6		3	75	149	22.2	
440 to 519	8	474	310	137	4	2		5	7	7	2			1	2	7		1	66	145	27.2	
520 and over	11	699	390	278	6	2	1	6	21	20	8	5	3	1	4	19		1	93	147	61.4	
All farms	66	360	218	123	4	1		5	5	7	3	2	1	1	2	8		1	62	119	25.9	
Average																						
199 and under	11	140	85	49	3			3	1	3	1				1	4			53	92	12.3	
200 to 279	14	235	149	118	4			4	1	4	1	1			1	5	1	1	59	124	15.5	
280 to 359	16	318	198	103	5			5	2	5	2	1	1		1	3	1		55	101	19.3	
360 to 439	6	392	238	124	6		1	6	1	4	2		1	1	1	4	1	2	82	139	22.4	
440 to 519	8	474	308	136	4	1	1	4	6	7	2	2	1	1	1	7	2		78	148	27.2	
520 and over	11	699	394	274	6	2	1	6	20	19	8	5	2	1	4	22	2		97	165	59.7	
All farms	66	360	218	122	4	1		5	5	7	3	2	1		1	8	1	1	68	124	25.3	





Table 41. The relation between size of farm, the kind and number of animal units, and the farm and crop acres per animal unit in 1935, 1936, two-year average, and normal on 50 farms in

Union Township, Furnas County, Nebraska

Size group (acres)	No. of farms	Animal units					Farm	Crop
							acres	acres
		Horses	Cattle	Hogs	Poul- try	Total	per animal unit	per animal unit
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1935								
199 and under	7	3.9	7.9	0.6	1.9	14.3	8.6	5.0
200 to 279	8	4.4	9.6	1.9	1.9	17.8	12.8	7.9
280 to 359	12	5.1	13.9	0.5	2.1	21.6	14.4	9.7
360 to 439	5	6.5	13.1	1.2	2.2	23.0	16.3	10.6
440 to 519	8	6.0	16.3	2.9	2.4	27.6	17.6	11.1
520 and over	10	7.5	43.6	7.0	2.9	61.0	10.8	6.5
All farms	50	5.6	18.6	2.5	2.3	29.0	12.9	8.1
1936								
199 and under	7	3.1	8.5	1.1	1.9	14.6	8.6	4.6
200 to 279	8	4.3	9.9	2.3	1.8	18.3	12.8	8.2
280 to 359	12	4.8	14.3	1.5	1.5	22.1	14.4	9.0
360 to 439	5	6.1	13.3	2.2	2.4	24.0	16.3	9.9
440 to 519	8	5.1	17.9	1.8	2.1	26.9	17.6	11.5
520 and over	10	8.1	50.5	5.3	2.6	66.5	10.8	5.9
All farms	50	5.3	20.4	2.5	2.0	30.2	12.9	7.7
Average								
199 and under	7	3.5	8.2	0.9	1.9	14.5	8.6	4.8
200 to 279	8	4.4	9.7	2.1	1.8	18.0	12.8	8.0
280 to 359	12	5.0	14.1	1.0	1.8	21.9	14.4	9.3
360 to 439	5	6.3	13.2	1.6	2.3	23.4	16.3	10.3
440 to 519	8	5.5	17.1	2.4	2.3	27.3	17.6	11.3
520 and over	10	7.8	47.0	6.1	2.7	63.6	10.8	6.2
All farms	50	5.4	19.6	2.5	2.1	29.6	12.9	7.9
Normal								
199 and under	7	4.4	11.2	2.2	2.6	20.4	9.9	
200 to 279	8	5.1	9.7	4.7	1.5	21.0	11.8	
280 to 359	12	6.1	14.3	1.7	2.5	24.6	13.1	
360 to 439	5	10.1	13.3	6.3	2.0	31.7	12.9	
440 to 519	8	6.1	16.6	2.9	2.4	28.0	15.0	
520 and over	10	9.2	35.9	8.2	1.8	55.1	9.7	
All farms	50	6.7	17.7	4.2	2.2	30.8	11.7	



Table 42. The total valuations, and their percentage distribution into personal, real estate, and public utilities, and the school levy with its ratio to the total levy for the 93 rural school districts in Furnas County, Nebraska, 1930 and 1935

		Assessed valuation of property					School levy	
District number	Year	Total	Percentage distribution					
			Per cent per- sonal	Per cent real estate	Per cent public utilities	Mills of total levy		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
1	:1930:	124075	: 11	: 89	: *	: 7.5	: 55.4	
	:1935	78902	: 8	: 92	: *	: 6.8	: 49.4	
2	:1930:	224660	: 14	: 86	: *	: 5.5	: 47.7	
	:1935:	145021	: 11	: 89	: *	: 7.1	: 50.5	
3	:1930:	116910	: 11	: 89	: *	: 8.0	: 57.0	
	:1935:	72150	: 4	: 96	: *	: 9.4	: 57.5	
5	:1930:	224665	: 15	: 64	: 21	: 5.0	: 45.3	
	:1935:	140132	: 10	: 69	: 21	: 7.2	: 50.9	
7	:1930:	148080	: 11	: 89	: *	: 9.0	: 59.8	
	:1935:	98490	: 11	: 89	: *	: 8.7	: 55.6	
8	:1930:	255645	: 17	: 85	:	: 7.0	: 53.7	
	:1935:	157530	: 19	: 81	:	: 6.2	: 47.1	
9	:1930:	199585	: 18	: 82	: *	: 6.0	: 49.8	
	:1935:	125226	: 16	: 84	: *	: 7.6	: 52.2	
10	:1930:	267310	: 15	: 62	: 23	: 4.0	: 39.8	
	:1935:	164225	: 10	: 67	: 23	: 6.8	: 49.5	
11	:1930:	280320	: 30	: 70	: *	: 4.0	: 39.8	
	:1935:	177000	: 19	: 81	: *	: 6.6	: 48.7	
12	:1930:	79620	: 25	: 74	: 1	: 9.0	: 59.8	
	:1935:	58150	: 15	: 87	: *	: 10.6	: 60.4	
13	:1930:	197140	: 12	: 67	: 21	: 4.0	: 39.8	
	:1935:	123945	: 7	: 72	: 21	: 5.2	: 42.8	
14	:1930:	423590	: 9	: 43	: 48	: 4.0	: 39.8	
	:1935:	267870	: 7	: 47	: 46	: 6.3	: 47.5	



Table 42. (continued)

District number	Year	Assessed valuation of property			Percentage distribution			School levy	
		Total	Per cent: per- sonal	Per cent: real estate	Per cent: public utilities	Mills	of total levy	Per cent	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
16	:1930:	181450	23	76	1	6.0	49.8		
	:1935:	105595	19	80	1	8.4	54.7		
17	:1930:	369150	9	58	33	4.0	39.8		
	:1935:	238855	10	59	31	6.6	48.7		
22	:1930:	173760	23	77		4.5	42.7		
	:1935:	108775	18	82	*	3.6	34.1		
23	:1930:	171060	11	89	*	6.0	49.8		
	:1935:	108065	5	95	*	8.4	54.7		
24	:1930:	178740	11	89	*	4.5	42.7		
	:1935:	115920	11	89	*	7.6	52.2		
25	:1930:	63240	11	89	*	1.0	14.2		
	:1935:	41845	8	92	*	3.6	34.1		
26	:1930:	126180	18	82	*	8.5	58.5		
	:1935:	74540	7	93	*	3.6	34.1		
27	:1930:	120810	24	76	*	1.0	14.2		
	:1935:	79215	21	79	*	3.6	34.1		
28	:1930:	373705	10	40	50	5.5	47.7		
	:1935:	233050	7	44	49	7.4	51.6		
29	:1930:	427730	23	60	17	3.5	36.7		
	:1935:	235955	8	72	20	6.2	47.1		
31	:1930:	226650	15	68	17	5.5	47.7		
	:1935:	126950	7	74	19	6.0	46.3		
32	:1950:	120210	16	84	*	7.5	55.4		
	:1935:	72788	8	92	*	9.8	58.5		
33	:1930:	215215	17	82	1	6.5	51.8		
	:1935:	140150	10	87	3	8.0	53.5		





Table 42. (continued)

District number	Year	Assessed valuation of property			Percentage distribution			School levy	
		Total	Per cent per- sonal	real estate	public utilities	Mills	of total levy	Per cent	of total levy
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
34	:1930:	402455	12	33	55	4.0	39.8		
	:1935:	241304	10	35	55	6.2	47.1		
35	:1930:	177130	24	76	*	9.0	59.8		
	:1935:	104654	10	90	*	7.8	52.9		
36	:1930:	138800	20	80	*	7.0	53.7		
	:1935:	88170	14	86	*	6.4	47.9		
37	:1930:	89525	17	82	1	9.0	59.8		
	:1935:	57250	12	86	2	11.6	62.5		
38	:1930:	167205	18	82	*	8.0	57.0		
	:1935:	113245	13	87	*	7.7	52.6		
39	:1930:	95125	9	91	*	6.0	49.8		
	:1935:	61053	5	94	1	6.4	47.9		
40	:1930:	105955	18	82	*	8.0	57.0		
	:1935:	66385	13	87	*	11.2	61.7		
41	:1930:	200195	18	82		6.0	49.8		
	:1935:	126300	14	86		7.6	52.2		
42	:1930:	133230	13	87	*	1.0	14.2		
	:1935:	86415	8	92	*	7.2	50.9		
43	:1930:	169845	21	79	*	7.0	53.7		
	:1935:	112853	13	86	1	8.2	54.1		
44	:1930:	200655	12	88		6.0	49.8		
	:1935:	129870	9	91	*	6.4	47.9		
45	:1930:	132175	25	75	*	8.5	58.5		
	:1935:	77365	14	86	*	9.6	58.0		
46	:1930:	188655	14	86	*	6.5	51.8		
	:1935:	116600	7	93	*	7.6	52.2		



Table 42. (continued)

District number	Year	Assessed valuation of property			Percentage distribution			School levy	
		Total	Per cent: per- sonal	Per cent: real estate	Per cent: public utilities	Per cent: Mills	Per cent of total levy		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
47	:1930:	152560	: 18	: 82	:	5.5	: 47.7		
	:1935:	91310	: 9	: 91	: *	7.0	: 50.2		
48	:1930:	129560	: 18	: 82	: *	7.5	: 55.4		
	:1935:	84610	: 15	: 85	: *	8.4	: 54.7		
49	:1930:	324635	: 8	: 48	: 44	5.0	: 45.3		
	:1935:	211445	: 7	: 52	: 41	7.0	: 50.2		
50	:1930:	165030	: 18	: 82	: *	7.0	: 53.7		
	:1935:	91235	: 7	: 92	: 1	6.4	: 47.9		
51	:1930:	160400	: 16	: 84	: *	6.0	: 49.8		
	:1935:	104840	: 12	: 87	: 1	9.4	: 57.5		
52	:1930:	125565	: 17	: 83	: *	9.0	: 59.8		
	:1935:	77722	: 3	: 92	: *	8.8	: 55.9		
55	:1930:	155160	: 21	: 79	: *	6.0	: 49.8		
	:1935:	91875	: 9	: 91	: *	8.4	: 54.7		
56	:1930:	143580	: 18	: 82	: *	5.0	: 45.3		
	:1935:	88960	: 11	: 89	: *	7.0	: 50.2		
57	:1930:	137930	: 15	: 85	:	9.0	: 59.8		
	:1935:	88010	: 14	: 86	:	7.0	: 50.2		
58	:1930:	120580	: 16	: 84	: *	7.0	: 53.7		
	:1935:	74495	: 7	: 95	: *	6.4	: 47.9		
59	:1930:	124625	: 16	: 84	: *	8.0	: 57.0		
	:1935:	77405	: 9	: 91	: *	8.6	: 55.3		
60	:1930:	90130	: 11	: 89	: *	9.0	: 59.8		
	:1935:	58585	: 7	: 93	: *	5.6	: 34.1		
61	:1930:	213265	: 14	: 86	: *	6.5	: 47.7		
	:1935:	158450	: 7	: 92	: 1	8.0	: 53.5		





Table 42. (continued)

District number	Year	Assessed valuation of property					School levy	
		Total	Percentage distribution			Mills	Per cent of total levy	
			Per cent per- sonal	Per cent real estate	Per cent public utilities			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
62	:1930:	116000	14	86	*	9.0	59.8	
	:1935:	75667	11	89	*	7.6	48.7	
63	:1930:	288470	8	43	49	5.0	45.3	
	:1935:	185346	6	48	46	7.0	50.2	
64	:1930:	115805	13	86	1	7.0	53.7	
	:1935:	74425	5	94	1	8.4	54.7	
65	:1930:	103020	24	76	*	7.0	53.7	
	:1935:	59390	10	89	1	10.4	59.9	
66	:1930:	97620	13	87	*	8.0	57.0	
	:1935:	71945	21	79	*	10.2	59.5	
67	:1930:	185080	17	83	*	8.5	58.5	
	:1935:	120145	12	87	1	8.6	55.3	
68	:1930:	190975	31	69	*	4.0	39.8	
	:1935:	107745	16	84	*	11.6	62.5	
70	:1930:	134650	20	80		8.5	58.5	
	:1935:	86030	13	87		10.6	60.4	
71	:1930:	151165	11	89	*	5.5	47.7	
	:1935:	99795	11	89	*	9.2	57.0	
72	:1930:	94025	18	82	*	3.5	36.7	
	:1935:	56610	7	93	*	9.0	56.4	
73	:1930:	99100	18	82		9.0	59.8	
	:1935:	59740	15	85		11.6	62.5	
74	:1930:	175650	9	73	18	6.5	51.8	
	:1935:	107510	5	76	19	9.8	58.5	



Table 42. (continued)

District number	Assessed valuation of property		Percentage distribution			School levy	
	Year	Total	Per cent			Per cent	
			: per- : sonal	: real : estate	: public : utilities	: Mills	: of total : levy
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
75	:1930:	139320	: 17	: 83	: *	: 7.0	: 53.7
	:1935:	86918	: 14	: 86	: *	: 9.4	: 57.5
76	:1930:	90590	: 12	: 88	: *	: 1.0	: 14.2
	:1935:	58237	: 8	: 92	: *	: 8.0	: 55.5
77	:1930:	93150	: 19	: 81	: *	: 9.0	: 59.8
	:1935:	57288	: 14	: 86	: *	: 11.0	: 61.3
79	:1930:	160380	: 19	: 81	:	: 6.0	: 49.8
	:1935:	79470	: 15	: 85	:	: 11.2	: 61.7
80	:1930:	122580	: 17	: 83	: *	: 9.0	: 59.8
	:1935:	79319	: 9	: 91	: *	: 11.2	: 61.7
81	:1930:	261020	: 21	: 61	: 18	: 5.0	: 45.3
	:1935:	147770	: 11	: 69	: 20	: 8.0	: 53.5
82	:1930:	70360	: 14	: 86	:	: 9.0	: 59.8
	:1935:	48855	: 12	: 88	:	: 11.6	: 62.5
83	:1930:	55375	: 23	: 76	: 1	: 9.0	: 59.8
	:1935:	32515	: 16	: 85	: 1	: 5.7	: 45.1
84	:1930:	178135	: 18	: 82	: *	: 6.5	: 51.8
	:1935:	93532	: 11	: 89	: *	: 7.0	: 50.2
85	:1930:	120720	: 18	: 82	:	: 5.5	: 47.7
	:1935:	77393	: 8	: 92	: *	: 9.6	: 58.0
86	:1930:	216740	: 12	: 59	: 29	: 6.0	: 49.8
	:1935:	128003	: 5	: 65	: 30	: 8.4	: 54.7
87	:1930:	124475	: 21	: 79	: *	: 9.0	: 59.8
	:1935:	71410	: 13	: 87	: *	: 11.0	: 61.3
88	:1930:	155980	: 19	: 81	: *	: 4.5	: 42.7
	:1935:	96675	: 14	: 86	:	: 11.0	: 61.5



Table 42. (continued)

District number	Year	Assessed valuation of property			Percentage distribution			School levy	
		Total	Per cent			Per cent			
			per- sonal	real estate	public utilities	Mills	of total levy		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
89	:1930:	228290	18	69	13	6.5	51.8		
	:1935:	127000	4	81	15	6.8	49.5		
90	:1930:	89550	24	76	*	9.0	59.8		
	:1935:	55040	15	85	*	11.6	62.5		
91	:1930:	73850	6	94	*	9.0	59.8		
	:1935:	49865	6	94	*	11.6	62.5		
92	:1930:	107685	12	88	*	9.0	59.8		
	:1935:	66055	6	93	1	10.6	60.4		
93	:1930:	117775	14	86	*	8.0	57.0		
	:1935:	76145	10	89	1	9.0	56.4		
94	:1930:	69115	13	87	*	9.0	59.8		
	:1935:	47285	11	89	*	10.0	59.0		
95	:1930:	107170	19	71	10	6.0	49.8		
	:1935:	66000	8	81	11	10.6	60.4		
96	:1930:	142075	18	82	*	5.5	47.7		
	:1935:	93945	16	84	*	9.6	58.0		
97	:1930:	81225	10	90	*	9.0	59.8		
	:1935:	57070	9	91	*	11.0	61.3		
98	:1930:	161495	16	84	*	6.0	49.8		
	:1935:	112675	14	86	*	8.2	54.1		
100	:1930:	125565	25	74	1	6.5	51.8		
	:1935:	76535	15	84	1	3.6	34.1		
101	:1930:	98250	14	86	*	4.5	42.7		
	:1935:	60855	11	89	*	13.6	66.2		
102	:1930:	69505	18	82		9.0	59.8		
	:1935:	40265	4	96		11.6	62.5		





Table 42. (concluded)

District number	Year	Assessed valuation of property			Percentage distribution			School levy	
		Total	Per cent			Per cent			
			per- sonal	real estate	public utilities	Mills of total levy			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
104	:1930:	120660	: 25	: 75	: *	: 5.5	: 47.7		
	:1935:	75055	: 19	: 80	: 1	: 9.6	: 58.0		
105	:1930:	77465	: 13	: 86	: 1	: 9.0	: 59.8		
	:1935:	51185	: 10	: 90	: *	: 11.6	: 62.5		
106	:1930:	388425	: 24	: 53	: 23	: 9.0	: 59.8		
	:1935:	224900	: 12	: 63	: 25	: 9.6	: 58.0		
107	:1930:	98165	: 17	: 83	:	: 9.0	: 59.8		
	:1935:	62350	: 9	: 91	:	: 11.6	: 62.5		
Average	:1930:	160475	: 17	: 73	: 10	: 6.6	: 52.4		
	:1935:	99717	: 11	: 81	: 8	: 8.4	: 54.9		

\* Less than one-half of one per cent



Table 43. Relation between size of farm and the financial progress of 27 farmers since locating on the farms they are now operating in Union Township, Furnas County, Nebraska.

Item	Size groups (acres)							
	: All farms:	199 and : under :	200 to : 279 :	200 to : 359 :	200 to : 439 :	200 to : 519 :	200 to : 520 and over :	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Number of farms (total)	27	2	4	7	4	5	5	
Acres operated	398	120	230	321	390	477	680	
Years operated	20.2	4.5	26.0	14.9	28.8	19.6	23.0	
Assets at beginning	\$4160	\$1114	\$2607	\$5932	\$1065	\$5807	\$4970	
Liabilities at beginning	1045	275	276	1614	300	900	1910	
Net worth at beginning	\$3116	\$838	\$2331	\$4318	\$765	\$4907	\$3060	
Unusual income	450		712	714	125	670	90	
Unusual losses	1063		819	500	1435	1557	1680	
Net additions to business	- 613		- 107	214	-1310	- 887	- 1590	
Net put into business	2503	838	2224	4532	- 545	4020	1470	
Assets 1936	9268	745	7301	9805	5015	7477	18690	
Liabilities 1936	1049	792	399	1504	544	988	1577	
Net worth 1936	8219	- 47	7002	8301	4471	6489	17113	
Capital increase	5716	\$-885	4778	3769	\$5016	\$2469	\$15643	

Shaded











